

IPENZ ENGINEERING UPDATE August 2007

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We welcome your feedback including suggestions for topics to be covered in our Feature Focus.

Risk Management/Project Management/Cost Management/Financing

√IPENZ 06/01 Estimating design fees for transportation projects.

Del Puerto, C., Gransberg, D and Robson, K. AACE International Transactions, (2006) Pages EST20.1-EST20.7.

Discusses the difficulties in estimating fees that are fair to all parties. There is a perception that because transport projects do not require a lot of aesthetic detail the design fee should be lower. A recent study found that engineering design fees have substantially lacked inflation over the last three decades. New Zealand methods are discussed.

√IPENZ 06/02 Achieving success in large projects : implications from a study of ERP implementations.

Ferratt, T. et al. Interfaces, Volume 36 Issue 5 (September/October 2006) Pages 458-469.

A study of 70 enterprise-resource-planning (ERP) projects—aiming to discover best practices for project success.

√IPENZ 06/03 Understanding the key risks in project management in China.

Zou, P., Zhang, G and Wang, J. International Journal of Project Management, Volume 25 Issue 6 (2007) Pages 601-614.

The aim of this paper is to understand the key risks in construction projects in China and to develop strategies to manage them. Risks were prioritized according to their significance of influences on typical project objectives in terms of cost, time, quality, safety and environmental sustainability, and then scrutinized from a joint perspective of project stakeholders and life cycle. These risks were compared with the findings of a parallel survey in the Australian construction industry context to highlight the unique risks associated with construction projects in China. Strategies to manage the risks were sought from the perspectives of project stakeholders and life cycle and in light of the Chinese construction culture.

√IPENZ 06/04 Internet-based database management system for project control.

Li, J., Moselhi, O and Alkass, S. Engineering, Construction and Architectural Management, Volume 13 Issue 3 (2006) Pages 242-253.

Suggests a system to efficiently track and control construction activities with an internet based platform.

√IPENZ 06/05 Project performance : how to assess the early stages.

Parson, V. Engineering Management Journal, Volume 18 Issue 4 (December 2006) Pages 11-15.

√IPENZ 06/06 Estimating the risk of technology development.

Wilhite, A and Lord, R. Engineering Management Journal, Volume 18 Issue 3 (September 2006) Pages 3-10.

A case study is presented on risk management as applied to the development of advanced technologies.

Management/Leadership/Strategic Planning/Recruitment/Training and Development

√IPENZ 06/07 What it means to work here.

Erickson, T and Gratton, L. Harvard Business Review, Volume 85 Issue 3 (March 2007) Pages 104-112.

What distinguishes a company that has deeply engaged and committed employees from another one that doesn't? It's not a certain compensation scheme or talent-management practice. Instead, it's the ability to express to current and potential employees what makes the organization unique. Companies with highly engaged employees articulate their values and attributes through "signature experiences" –visible, distinctive elements of the work environment that send powerful messages about the organization's aspirations and about the skills, stamina, and commitment employees will need in order to succeed there. Companies that successfully create and communicate signature experiences understand that not all workers want the same things. Indeed, employee preferences are an important but often overlooked factor in the war for talent.

√IPENZ 06/08 What to Ask the Person in the Mirror.

Kaplan, R. Harvard Business Review, Volume 85 Issue 1 (January 2007) Pages 86-95.

As leaders rise through the ranks, they have fewer and fewer opportunities for honest and direct feedback. Their bosses are no longer monitoring their actions, and by the time management missteps have a negative impact on business results, it's usually too late to make course corrections that will set things right. Therefore, it is wise to go through a self-assessment, to periodically step back from the bustle of running a business and ask some key questions of yourself.

√IPENZ 06/09 Dancing in the white spaces: Exploring gendered assumptions in successful project managers' discourse about their work

Thomas, J and Buckle-Henning, P. International Journal of Project Management, Volume 25 Issue 6 (2007) Pages 552-559.

By design, bodies of knowledge capture and influence best working practices. Gendered assumptions based on masculine cognitive styles are predominant in the Guide to the Project Management Body of Knowledge (PMBOK) [PMI. Project Management Body of Knowledge. Project Management Institute 1996]. This study investigates the assumptions and cognitive styles embedded in successful project managers' discussions of their working practices. Both male and female project managers exhibit sophisticated skill in balancing masculine and feminine cognitive styles and attribute their success to "dancing in the white spaces" between the lines laid out by the PMBOK. This raises important questions about the role of the PMBOK in training and certifying project managers

√IPENZ 06/10 Engineering education, accreditation and the Bologna Declaration : a New Zealand view.

Hodgson, R and Williams, B. International Journal of Electrical Education, Volume 44 Issue 2 (April 2007) Pages 124-128.

Professional engineering in education in New Zealand and the role of the IPENZ as the national signatory of the Washington Accord is discussed.

√IPENZ 06/11 **The Bologna process and its potential influence on Australian engineering education.**
King, R. International Journal of Electrical Education, Volume 44 Issue 2 (April 2007) Pages 118-123.

√IPENZ 06/12 **Strategy & Society: The Link between Competitive Advantage and Corporate Social Responsibility.**

Porter, M and Kramer, M. Harvard Business Review, Volume 84 Issue 12 (December 2006) Pages 78-92.

It has become more common for companies to be held account for the social consequences of their actions. Corporate social responsibility (CSR) has emerged as an inescapable priority for business leaders in every country. Frequently, though, CSR efforts are counterproductive. The authors propose a fundamentally new way to look at the relationship between business and society. Perceiving social responsibility as an opportunity rather than as damage control or a PR campaign requires a mind-set that will become increasingly important to competitive success.

√IPENZ 06/13 **Reengineering engineers : management philosophies at the Jet Propulsion Laboratory in the 1990s.**

Westwick, P. Technology and Culture, Volume 48 Issue 1 (January 2007) Pages 67-91.

√IPENZ 06/14 **The future of organization development : enabling sustainable business performance through people.**

Wirtenberg, J. et al. Organization Development Journal, Volume 25 Issue 2 (Summer 2007) Pages 111-122.

√IPENZ 06/15 **Sustainable suppliers : sustainable markets.**

Reeve, T and Steinhausen, J. CMA Management, Volume 81 Issue 2 (April 2007) Pages 30-33.

Discusses the value of including sustainability into business strategy and purchasing. Includes a one page summary entitled "Ten steps to sustainable purchasing success."

√IPENZ 06/16 **Investigative negotiation.**

Deepak, M and Bazerman, M. Harvard Business Review, Volume 85 Issue 9 (September 2007) Pages 72-78.

Negotiators often fail to achieve results because they channel too much effort into selling their own position and too little into understanding the other party's perspective. To get the best deal—or, sometimes, any deal at all—negotiators need to think like detectives, digging for information about why the other side wants what it does. This investigative approach entails a mind-set and a methodology, say Harvard Business School professors Malhotra and Bazerman. Inaccurate assumptions about the other side's motivations can lead negotiators to propose solutions to the wrong problems, needlessly give away value, or derail deals altogether.

Technical Aspects of Engineering –Abstracts available upon request.

√IPENZ 06/17 Theoretical treatment of crowd-structure interaction dynamics.

Alexander, N. Proceedings of the Institution of Civil Engineers : Structures and Buildings, Volume 159 Issue SB6 (2006) Pages 329-338.

√IPENZ 06/18 Crowd induced rhythmic loading.

Parkhouse, J and Ewins, D. Proceedings of the Institution of Civil Engineers : Structures and Buildings, Volume 159 Issue SB5 (2006) Pages 247-255.

√IPENZ 06/19 Modelling effects of passive crowds on grandstand vibration.

Sim, J., Blakeborough, A and Williams, M. Proceedings of the Institution of Civil Engineers : Structures and Buildings, Volume 159 Issue SB5 (2006) Pages 261-272.

IPENZ 06/20 Prioritization of bridges and tunnels in earthquake risk mitigation using multicriteria decision analysis: Application to Lisbon.

Costa, B., Oliveira, C and Vieira, B. Omega, Volume 36 Issue 3 (2008) Pages 442-450.
A model is described which helps with assessing bridges and tunnels according to their structural vulnerability and strategic importance. This can be used to establish priority for retrofitting and emergency management.

IPENZ 06/21 Earthquake failures of cantilever projections buildings.

Dogan, M., Unluoglu, E and Ozbasaran, H. Engineering Failure Analysis, Volume 14 Special Issue. 8 (2007) Pages 1458-1465.

IPENZ 06 /22 An earthquake scenario for the microzonation of Sofia and the vulnerability of structures designed by use of the Eurocodes.

Ivanka, P et al. Soil Dynamics and Earthquake Engineering, Volume 27 Issue 11 (2007) Pages 1028-1041.

IPENZ 06 /23 Stability of waterfront retaining walls subjected to pseudo-static earthquake forces

Choudhury, D and Ahmad, S. Ocean Engineering, Volume 34 Issue 14-15 (2007) Pages 1947-1954.

IPENZ 06 /24 Cyclic performance of repaired concrete-filled steel tubular columns after exposure to fire

Han, L., Lin, X and Wang, Y. Thin-Walled Structures, Volume 44 Issue10 (2007) Pages 1063-1076.

√IPENZ 06/25 **Fifteen things to know about cooling water treatment.**

Gaines,B and Orban,M and Welch, D. ASHRAE Journal, Volume 49, Issue 7 (July 2007) Pages 50-57.

√IPENZ 06/26 **Study of using microfiltration and reverse osmosis membrane technologies for reclaiming cooling water in the power industry.**

Water Environment Research, Volume 79 Issue 7 (July 2007) Pages 753-758.

IPENZ 06/27 **Rebound and residual in situ pavement displacements measured during NAPTf performance testing.**

Gopalakrishnan, K and Thompson, M. International Journal of Pavement Engineering, 8 Issue 3 (2007) Pages 187-201.

√IPENZ 06/28 **Pavement moduli variation under heavy aircraft trafficking.**

Gopalakrishnan, K and Thompson, M. Proceedings of the Institution of Civil Engineers : Transport, Volume 159 Issue TR3 (August 2006) Pages 117-125.

√IPENZ 06/29 **A decision support model for junction improvement schemes.**

Vassou, V., Labib, A and Roberts, M. Proceedings of the Institution of Civil Engineers : Transport, Volume 159 Issue TR3 (August 2006) Pages 127-134.

√IPENZ 06/30 **Lateral position of traffic negotiating horizontal bends.**

Gunay, B and Woodward, D. Proceedings of the Institution of Civil Engineers : Transport, Volume 160 Issue TR1 (February 2007) Pages 1-11.

√IPENZ 06/31 **Creating walkable urban environments.**

Barnett, S. I. Proceedings of the Institution of Civil Engineers: Engineering Sustainability, Volume 159 Issue ES3 (September 2006) Pages 91-97.

√IPENZ 06/32 **Designing sustainable on-site CHP systems.**

Meckler, M., Hyman, L and Landis, K. ASHRAE Transactions, Volume 113 Part 1 (2007) Pages 80-88.

√IPENZ 06/33 **Closed-loop ground coupled heat pump systems.**

Bernier, M. ASHRAE Journal, Volume 48 Issue 9 (September 2006) Pages 12-24.

√IPENZ 06/34 **Development of a ground-source heat pump with ground heat exchanger utilizing cast-in-place concrete pile foundations of buildings.**

Sekine, K et al. ASHRAE Transactions, Volume 113 Part 1 (2007) Pages 558-566.

√IPENZ 06/35 **Modeling and performance simulation of a gas cooler for a CO2 heat pump system.**
Chang, Y and Kim, M. HVAC&R Research, Volume 13 Issue 3 (May 2007) Pages 445-456.

√IPENZ 06/36 **Planning for effective digital asset management.**
Sawyer, A. Broadcast Engineering, Volume 48 Issue 7 (July 2006) Pages 38-43.

√IPENZ 06/37 **Sustainable construction in New Zealand.**
Warnock, A. New Zealand Journal of Environmental Law, Volume 9 (2005) Pages 337-376.

IPENZ 06/38 **Regulated emissions from biodiesel fuels from on/off-road applications.**
Durbin, T et al. Atmospheric Environment, Volume 41 Issue 27 (2007) Pages 5647-5658.
This research which was conducted for the military is one of the largest studies of biodiesel in both on-road and off-road uses.

√IPENZ 06/39 **The road to the Model T : culture, road conditions and innovations at the dawn of the American motor age.**
Wells, C. Technology and Culture, Volume 48 Issue 3 (July 2007) Pages 497-523.

IPENZ 06/40 **Airport availability modelling: A different perspective.**
Rakas, J and Hecht, M. International Journal of Critical Infrastructures, Volume 3 Issue 3-4 (2007) Pages 430-456.

IPENZ 06/41 **The impacts of transportation infrastructure on property values: A higher-order spatial econometrics approach**
Cohen, J and Paul, C. Journal of Regional Science, Volume 47 Issue 3 (2007) Pages 457-478.

√IPENZ 06/42 **Subgrade stress ratios as airfield pavement rutting performance indicators.**
Gopalakrishnan, K and Thompson, M. Canadian Journal of Civil Engineering, Volume 34 Issue 2 (February 2007) Pages 189-198.

√IPENZ 06/43 **Identification of potentially toxic compounds in complex extracts of environmental samples using gas chromatography–mass spectrometry and multivariate data analysis.**
Bergknut, M et al. Environmental Toxicology and Chemistry, Volume 26 Issue 2 (February 2007) Pages 208-207.

√IPENZ 06/44 **Characteristics of free overfall for supercritical flows.**
Tokyay, N and Yildiz, D. Canadian Journal of Civil Engineering, Volume 34 Issue 2 (February 2007) Pages 162-169.

√IPENZ 06/45 **Holistic model for atmospheric corrosion. Part 7. Cleaning of salt from metal.**
Cole, I and Paterson, D. Corrosion Engineering, Science and Technology, Volume 42 Issue 2 (June 2007) Pages 106-

√IPENZ 06/46 **Stress corrosion cracking of X-70 pipeline steel in near neutral pH solution.**
Fang, B et al. Corrosion, Science and Technology, Volume 42 Issue 2 (June 2007) Pages 123-

√IPENZ 06/47 **Backwater effect due to a single spur dike.**
Azinfar, H and Kells, J. Canadian Journal of Civil Engineering, Volume 34 Issue 1 (January 2007) Pages 107-115.

√IPENZ 06/48 **Directional kriging : a proposal to determine sediment transport.**
Lucio, P et al. Journal of Coastal Research, Volume 22 Issue 6 (November 2006) Pages 1340-

√IPENZ 06/49 **Processes controlling development of erosional hot spots on a beach nourishment project.**
Benedet, L., Finkl, C and Hartog, W. Journal of Coastal Research, Volume 23 Issue 2 (January 2007) Pages 33-

√IPENZ 06/50 **Characterizing the risks to aquatic ecosystems : a tentative approach in the context of freshwater dredged material disposal.**
Babut, M et al. Integrated Environmental Assessment and Management, Volume 2 Issue 4 (October 2006) Pages 330-

PENZ 06/51 **Water scarcity : the food factor.**
Molden, D., de Fraiture, C and Rijsberman, F. Issues in Science and Technology, Volume 23 Issue 4 (Summer 2007) Pages 39-

√IPENZ 06/52 **A comparison of railway track foundation design methods.**
Burrow, M., Bowness, D and Ghataora, G. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue F1 (March 2007) Pages 1-

√IPENZ 06/53 **Modelling wear and crack initiation in rails.**
Franklin, F and Kapoor, A. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue F1 (March 2007) Pages 23-

√IPENZ 06/54 **The Madrid-Seville line experience.**
Guiraro, B. Proceedings of the Institution of Civil Engineers: Transport, Volume 159 Issue TR3 (August 2006) Pages 109-116.

√IPENZ 06/55 **Tidal current resource assessment.**

Bryden, I., Couch, S and Melville, G. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue A2 (March 2007) Pages 125-

√IPENZ 06/56 **Marine current turbines : pioneering the development of marine kinetic energy converters.**

Fraenkel, P. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue A2 (March 2007) Pages 159-

√IPENZ 06/57 **New friction welding process for pipeline girth welds – parameter optimization.**

Faes, K., Dhooge, A. and D'Alvise, L.. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue B5 (May 2007) Pages 897-

√IPENZ 06/58 **Protection of underground gas pipelines from third party damage by on-line monitoring using piezoelectric accelerometers.**

Cao, C et al. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue E1 (February 2007) Pages 61-

√IPENZ 06/59 **A review of fluid-driven pipeline pigs and their applications.**

Quarini, J and Shire, S. Proceedings of the Institution of Mechanical Engineers, Volume 221 Issue E1 (February 2007) Pages 1-

√IPENZ 06/60 **Office building characteristics and the links with carbon emissions.**

Wilkinson, S and Reed, R. Structural Survey, Volume 24 Issue 3 (2006) Pages 240-

IPENZ 06/61 **Durability of cementing binders based on fly ash and other wastes.**

Singh, M., and Garg, M. Construction and Building Materials, Volume 21 Issue 11 (2007) Pages 2012-2016.

IPENZ 06 /62 **Introduction of a waste incineration tax: Effects on the Swedish waste flows.**

Sahlin, J. et al. Resources, Conservation and Recycling, Volume 51 Issue 4 (2007) Pages 827-846.

IPENZ 06 /63 **Production of lightweight aggregates from mining residues, heavy metal sludge, and incinerator fly ash.**

Huang, S et al. Journal of Hazardous Materials, Volume 144 Issue 1-2 (2007) Pages 52-58.

SPECIAL FOCUS ON.....E-WASTE (Electronic Waste)

IPENZ 06/64 Aquatic toxicity of leachates generated from electronic devices.

Dagan,R. et al. Archives of Environmental Contamination and Toxicology, Volume 53 Issue 2 (2007)
Pages 168-173.

IPENZ 06/65 California households' willingness to pay for 'green' electronics.

Saphores, J et al. Journal of Environmental Planning and Management, Volume 50 Issue 1 (2007)
Pages 113-133.

IPENZ 06/66 Charging up the batteries : squeezing more capacity and power into the new EU battery directive.

Kierkegaard, S. Computer Law and Security Report, Volume 23 Issue 4 (2007) Pages 357-364.
The pace of technological change with computers is creating a problematic scenario on what to do with the growing amount of electronic waste. E-junk is the fastest growing waste stream and the threat from spent batteries is growing as the volume in landfills grows. The European Union has passed the Batteries Directive following the producer responsibility model underpinned by legislation, whereby producers of electronic/electrical products must take responsibility for those products at the end of their life. The law aims to reduce sharply the amount of harmful substances that leak from used batteries when they are dumped with regular trash in landfill. However, without a significant change by the manufacturers and other countries, the battery-waste will continue to grow with all its health and environmental consequences.

IPENZ 06/67 Characterization of air emissions and residual ash from open burning of electronic wastes during simulated rudimentary recycling operations.

Gullett, B et al. Journal of Material Cycles and Waste Management, Volume 9 Issue 1 (2007)
Pages 69-79.

IPENZ 06/68 Economic analysis of electronic waste recycling : modeling the cost and revenue of a materials recovery facility in California.

Kang, H and Schoenung, J. Environmental Science and Technology, Volume 40 Issue 5 (2006) Pages 1672-1680.

IPENZ 06/69 Electrical and electronic waste : a global problem.

Babu, B., Parande, A and Basha, C. Waste Management & Research, Volume 25 Issue 4 (2007)
Pages 307-318.

Describes how e-waste is generated and classified. Gives strategies and technologies for recovering materials. The e-waste recycling industry in India is also discussed.

IPENZ 06/70 Investigating the use of vertical vibration to recover metal from electrical and electronic waste

Mohabuth, N., Hall, P and Miles, N. Minerals Engineering, Volume 20 Issue 9 Special Issue (2007), pp. 926-932.

Due to the current and future environmental legislation there is a need to develop cleaner technologies for separating materials in the mineral and recycling industries. This paper discusses the use of vertical vibration to recover valuable materials from electrical wastes.

IPENZ 06/71 Leaching assessments of hazardous materials in cellular telephones.

Lincoln, J et al. Environmental Science and Technology, Volume 41 Issue 7 (2007) Pages 2572-2578.

Evaluation of the consistency of hazardous waste classification by comparing various protocols for assessing the risks of discarded electronic products (e-waste).

IPENZ 06/72 A life cycle based multi-objective optimization model for the management of computer waste.

Ahluwalia, P and Nema, A. Resources, Conservation and Recycling, Volume 51 Issue 4 (October 2007) Pages 792-826.

The accelerating pace of waste generation from used electrical and electronic equipment of growing global concern. Within this waste stream, computer hardware is quite significant in terms of both volume and risk to the environment because of the hazardous materials within it. The model presented can help decision makers in integrated waste management.

IPENZ 06/73 Metals, non-metals and PCB in electrical and electronic waste - Actual levels in Switzerland

Morf, L et al. Waste Management, Volume 27 Issue 10 (2007) Pages 1306-1316.

IPENZ 06/74 Present status of the recycling of waste electrical and electronic equipment in Korea.

Lee, J., Song, H and Too, J. Resources, Conservation and Recycling, Volume 50 Issue 4 (June 2007) Pages 380-397.

This paper describes the present status of generation and recycling of waste electrical and electronic equipment in Korea, namely TVs, refrigerators, washing machines, air conditioners, personal computers and mobile phones in Korea.