

IPENZ ENGINEERING UPDATE May 2007

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Samplings from the May2007 Issue:

- Feature focus... on fuel cells
- Integrating traditional commercial buildings with intelligent building concepts
- Sustaining the competitive edge of project management
- Maximizing your return on people
- A comparison of fuel consumption between hybrid and intelligent vehicles during urban driving
- Transbays' downtown rail extension
- Weathered hydrocarbon wastes : a risk management primer

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

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

√IPENZ 03/01 **Board document retention : five best practices.**

Dickins, D and Bishop, M. Corporate Board, Volume 28 Issue 164 (May/June 2007) Pages 12-15

√IPENZ 03/02 **The process audit.**

Hammer, M. Harvard Business Review, Volume 85 Issue 4 (April 2007) Pages 111-123

Few executives question the idea that by redesigning business processes they can achieve extraordinary improvements. Yet many of them flounder, unsure about what exactly needs to be changed, by how much, and when. The author has spent the past five years working with a group of leading companies to develop the Process and Enterprise Maturity Model (PEMM), a new framework that helps executives in their transformation efforts.

√IPENZ 03 /03 **Maximizing your return on people.**

Bassi, L. and McMurrer, D. Harvard Business Review, Volume 85 Issue 3 (2007) Pages 115-123

Development of a system that allows executives to assess human capital management (HCM) and to use those metrics both to predict organizational performance and to guide organizations' investments in people. The new framework is based on a core set of HCM drivers that fall into five major categories: leadership practices, employee engagement, knowledge accessibility, workforce optimization, and organizational learning capacity

√IPENZ 03/04 **What your leader expects of you. (cover story)**

Bossidy,L. Harvard Business Review, Volume 85 Issue 4 (April 2007) Pages 58-65

Based on his experiences as a chairman and CEO, the author offers a set of behaviour characteristics that executives should expect from successful subordinates. What an executive's direct reports should expect from their superior is also presented. The author presents a sample performance evaluation form.

√IPENZ 03/05 **Can your company handle change?** Fleming, J. Gallup Management Journal Online; 3/8/2007, p1, 6p

In this interview Gallup principal John Fleming answers questions about implementing effective organisational change

√IPENZ 03/06 **Talent management: what's not working (cover story)**

D'Amico, E. Chemical Week, Volume 169 Issue 13 (4 April 2007) Pages 19-23.

√IPENZ 03/07 **Kaleidoscope careers: Benchmarking ideas for fostering family-friendly workplaces.**

Sullivan, S and Mainiero, L. Organizational Dynamics, Volume 36, Issue 1, (2007). Pages 45-62

Risk Management/Project Management/Cost Management/Financing/

IPENZ 03/08 **Integrating disaster management into construction : a UK perspective.**
Building Research & Information, Volume 35 Issue 2 (March 2007) Pages 163-177

√IPENZ 03/09 **Applying traits theory of leadership to project management.**
Project Management Journal, Volume 38 Issue 1 (March 2007) Pages 44-54.

√IPENZ 03/10 **Sustaining the competitive edge of project management.**
Brown, C. SAM Advanced Management Journal, Volume 72 Issue 1 (Winter2007) Pages 22-43.

√IPENZ 03/11 **Assessing performance trends on industrial construction mega projects.**
Faydek, A et al. Cost Engineering, Volume 48 Issue 10 (October 2006) Pages 16-21.

Technical Aspects of Engineering

√IPENZ 03/12 **Strategic planning for water utilities in developing countries.**
Mugabi,J., Kayaga, S. and Njiru,C. Utilities Policy, Volume 15, Issue 1 (March 200) Pages 1-8.

√IPENZ 03/13 **Integrating traditional commercial buildings with intelligent building concepts.**
Chan, K. Cost Engineering, Volume 49 Issue 3 (March 2007) Pages 25-36

IPENZ 03/14 **Cost evaluation of foam bitumen and other stabilisation alternatives**
Saleh, M.F International Journal of Pavement Engineering, Volume 8 Issue 2 (2007) Pages 157-161.

IPENZ 03/15 **Foamed bitumen mixes = Shear performance?**
Jenkins, K.J., Long, F.M. and Ebels, L.J.International Journal of Pavement Engineering,
Volume 8 Issue 2 (2007) Pages 85-98.

IPENZ 03/16 **Performance of foamed bitumen-stabilised mixtures**
K. Khweir. Proceedings of the Institution of Civil Engineers: Transport Volume 160, Issue 2 (May 2007) Pages 67-72

√IPENZ 03/17 **Au reservoir: some recent case studies of corrosion issues in water storage tanks and reservoirs.**
Nicholas, D. et al. Corrosion and materials,Volume 32 Issue 2 (April 2007) Pages 27-32.

IPENZ 03/18 Design charts for piles supporting embankments on soft clay

Poulos, H.G. Journal of Geotechnical and Geoenvironmental Engineering, Volume 133 Issue 5 (2007) Pages 493-501

IPENZ 03/19 Stability of man-made slopes

Rupke, J., Huisman, M and Kruse, H. Engineering Geology, Volume 91 Issue 1 (2007) Pages 16-24.

IPENZ 03/20 Environmental hazard analysis and effective remediation of highway seepage

Y.S., Qiu, X., Ma, F.S. Journal of Hazardous Materials, Volume 142 Issue 1-2 (2007) Pages 381-388.

IPENZ 03/21 Estimates of associated outdoor particulate matter health risk and cost reductions from alternative building, ventilation and filtration scenarios

Sultan, Z.M. (2007) Science of the Total Environment, Volume 377 Issue1 (2007) Pages 1-11.

IPENZ 03/22 HVAC and indoor thermal conditions in hospital operating rooms

Balaras, C., Dascalaki, E and Gaglia, A. Energy and Buildings, Volume 39 Issue 4 (2007) Pages 454-470.

IPENZ 03/23 An investigation of air inlet types in mixing ventilation

Lee, E. et al. Building and Environment, Volume 42 Issue 3 (2007) Pages 1089-1098.

√IPENZ 03/24 Improving public safety communications.

Peha, J. Issues in Science and Technology, Volume 23 Issue 2 (Winter 2007) Pages 61-

√IPENZ 03/25 Scoping study for daylight metrics from luminance maps

Howlett, O., Heschong, L., and McHugh, J. LEUKOS - Journal of Illuminating Engineering Society of North America, Volume 3 (Issue 3 (2007) Pages 201-215.

IPENZ 03/26 Congestion and variable user charging as an effective travel demand management instrument

Hensher, D. Puckett, S. (2007) Transportation Research Part A: Policy and Practice, Volume 41 Issue 7 Pages 615-626.

√IPENZ 03/27 Transbay's downtown rail extension.

Townsend, B and Penrice, D. Tunnels and tunnelling international, (April 2007) Pages 27-28,31

√IPENZ 03/28 Design-build failures involving geothermal systems.

Lotz, W.A. HPAC Heating, Piping, AirConditioning Engineering, Volume 78 Issue 9 (2006) Pages. 56-60.

- √IPENZ 03/29 **Hybrid geothermal heat pumps for Beachfront Hotel**
Barfield, A. ASHRAE Journal, Volume 48 Issue 9 (2006) Pages 48-52,55
- √IPENZ 03/30 **Compressive Behavior of Ultra-High-Performance Fiber-Reinforced Concrete**
Graybeal, B. ACI Materials Journal, Volume. 104, Issue 2 (March/April 2007) Pages146-152
- √IPENZ 03/31 **Cover Cracking of Reinforced Concrete Beams Due to Corrosion of Steel**
ACI Materials Journal, Volume. 104, Issue 2 (March/April 2007) Pages 153-161
- √IPENZ 03/32 **Analytical Evaluation of Bridge Columns with Double Interlocking Spirals**
Correal, J. et al. ACI Structural Journal, Volume 104 Issue 3 (May/June 2007) Pages 314-323.
- √IPENZ 03/33 **Comparison of Two Accelerated Corrosion Techniques for Concrete Structures**
Yuan, Y. et al. ACI Structural Journal, Volume 104 Issue 3 (May/June 2007) Pages 344-347.
- √IPENZ 03/34 **Estimating Cleanup Times for Groundwater Contamination Remediation Strategies**
Widdowson, M., Mendez, E and Chapelle, F. American Water Works Association Journal, Volume 99 Issue 3 (March 2007) Pages 40-42,44,46.
- √IPENZ 03/35 **Using spore removal to monitor plant performance for Cryptosporidium removal.**
Brown, R. and Cornwell, D. American Water Works Association Journal, Volume 99 Issue 3 (March 2007)
- √IPENZ 03/36 **Atmospheric corrosion of materials used in the civil construction industry.**
Da Silva, E. et al. Anti-Corrosion Methods and Materials, Volume 53 Issue 1 (2006) Pages 4-51.
- √IPENZ 03/37 **Solar technologies and the building envelope.**
Torcellini, P. et al. ASHRAE Journal, Volume 49 Issue 4 (April 2007) Pages 14-16,18,22.
- √IPENZ 03/38 **Variable refrigerant flow systems.**
Goetzler, W. ASHRAE Journal, Volume 49 Issue 4 (April 2007) Pages 24-26,28-29,31
- √IPENZ 03/39 **Applications of customized absorption heat pumps with heating capacities above 500 kv.**
Kren, C. et al. ASHRAE Transactions, Volume 113, Issue 1 (2007) Pages 65-79.
- √IPENZ 03/40 **Composting and greenhouse gas emissions : a producer's perspective.**
Brown, S and Subler, S. Biocycle, Volume 48 Issue 3 (2007) Pages 37-41.

- √IPENZ 03/41 **Hybrid fuzzy logic control strategies for hot water district heating systems**
Lianzhong, L and Zaheeruddin, M. Building Services Engineering Research and Technology, Volume 28, Issue 1 (February 2007) Pages 35-53.
- √IPENZ 03/42 **Determining the adventitious leakage of buildings at low pressure. Part 1: uncertainties**
Cooper, E.W. and Etheridge, D. Building Services Engineering Research and Technology, Volume 28, Issue 1 (February 2007) Pages 71-80
- √IPENZ 03/43 **A comparison of fuel consumption between hybrid and intelligent vehicles during urban driving.**
Manzie, C. et al. Proceedings of the Institution of Mechanical Engineers. Part D. Journal of automobile engineering, Volume 220 Issue DE (2006) Pages 67-76.
- √IPENZ 03/44 **Weathered hydrocarbon wastes : a risk management primer.**
Brassington, K. et al. Critical Reviews in Environmental Science and Technology, Volume 37 Issue 3 (2007) Pages 199-232.
- IPENZ 03/45 **Condition rating of RC structures : a case study.**
Coronelli, D. Journal of Building Appraisal, Volume 3 Issue 1 (Spring 2007) Pages 29-51.
- IPENZ 03/46 **Code requirements and sustainable design**
Mahlman, R., Clancy, J., Stauder, J. HPAC Heating, Piping, AirConditioning Engineering, Volume 79 Issue 2 (2007) Pages 34-37.
- IPENZ 03/47 **Characteristics of the bioreactor landfill system using an anaerobic-aerobic process for nitrogen removal**
Liu, He R. et al.(2007) Bioresource Technology, Volume 98 Issue 13) Pages 2526-2532.
- IPENZ 03/48 **Evaluation of alternative landfill cover soils for attenuating hydrogen sulfide from construction and demolition (C&D) debris landfills**
Plaza, C. et al. Journal of Environmental Management, Volume 84 Issue 3 (2007) Pages 314-322.
- IPENZ 03/49 **FRP materials for the rehabilitation of tubular steel structures, for underwater applications**
Seica, M.V. and Packer, J.A.. Composite Structures, Volume 80 Issue 3 (2007) Pages 440-450.
- √IPENZ 03/50 **Tower windmills in Medieval England : a case of arrested development?**
Langdon, J. and Watts, M. Technology and Culture, Volume 46 Issue 4 (2005) Pages 697-718.

IPENZ 03/51 Dynamic analysis of a cable-stayed deck steel arch bridge

Galvin, P. and Dominguez, J. Journal of Constructional Steel Research, Volume 63, Issue 8, (August 2007) Pages 1024-1035.

IPENZ 03/52 A distributed model of water balance in the Motueka catchment, New Zealand,

Andrew, R. and Dymond, J. Environmental Modelling & Software, Volume 22, Issue 10 (October 2007) Pages 1519-1528.

IPENZ 03/53 Temperatures and heating energy in New Zealand houses from a nationally representative study-HEEP

French, L. et al. Energy and Buildings, Volume 39, Issue 7(July 2007) Pages 770-782.

IPENZ 03/54 Driven to injustice? Environmental justice and vehicle pollution in Christchurch, New Zealand

Kingham, S. et al. Transportation Research Part D: Transport and Environment, Volume 12, Issue 4 (June 2007) Pages 254-263.

Books from the Energy Library Collection

✓IPENZ 03/55 **How to talk so people Listen: Connecting in today's workplace** (2006) Hamlin, Sonya. New York: Collins

This book contains helpful techniques for everything from negotiating the generation gap to integrating a multicultural workforce. Written in an informal, easily readable style, this 2006 edition has been updated to include Hamlin's advice on dealing with communication challenges in today's fast-paced, technologically driven workplace.

✓IPENZ 03/56 **The rough guide to climate change.** (2006) Henson, Robert. London: Rough Guides. This is in the category of popular work on climate change. The subject is explored in easily-read "bites", and there are many photographs and charts.

✓IPENZ 03/57 **The Long Emergency: Surviving the End of Oil, Climate Change, and Other Converging Catastrophes of the Twenty-First Century**

Kunstler, James Howard (2006). New York: Grove Press

Kunstler discusses the impending world oil shortage, the environmental crisis, and the economic and social fallout from the huge changes taking place in modern society

✓IPENZ 03/58 **Solar water heating guidebook : a technical guide for building industry professionals.** (2006) Wellington: Energy Efficiency and Conservation Authority

Provides a general guide for solar water heating systems in New Zealand for residential, commercial or industrial use. Includes information on: costs, benefits, general considerations, compliance,

standards, legal requirements and installation and design requirements.

✓IPENZ 03/59 **Solar revolution: the economic transformation of the global energy industry.**

(2006) Travis Bradford. Cambridge, USA: MIT

This comprehensive book sets out to show that solar energy is the answer to most of the world's energy problems. The author explores the limitations of alternative energy options and details the promising future for solar energy.

✓IPENZ 03/60 **Handbook on mechanical works inspection : a guide to effective practice**

Clifford Matthews. Mechanical Engineering Publications, 1997

Provides the techniques, guidelines and technical data needed to perform inspections on mechanical equipment found in power and process plant applications.

✓IPENZ 03/61 **Handbook of mechanical in-service inspection: pressure systems and mechanical plant** Clifford Matthews. Professional Engineering Publishing, 2004

This comprehensive sister volume to Cliff Matthews' highly successful Handbook of Mechanical Works Inspection gives a detailed coverage of pressure equipment and other mechanical plant such as cranes and rotating equipment

✓IPENZ 03/62 **Project report: MEPS for heat exchange water heaters** Palmer, Eric (2005) Wellington: EECA

This report looks at the impact of imposing MEPS on heat exchange water heaters and provides recommendations for the adoption of a new joint Australian New Zealand standard AS/NZS 4692.2: 2005

SPECIAL FOCUS ON.....Fuel Cells

✓IPENZ 03/63 **Fuel cell town : a feasibility study.**

Madni, Iftikhar. Cost Engineering; Mar2007, Vol. 49 Issue 3, p17-23

Tests the feasibility of using fuel cells as the sole source of electricity using a fictitious town with a population of 1,600.

✓IPENZ 03/64 **Is the public willing to pay for hydrogen buses? A comparative study of preferences in four cities**

O'Garra, T. et al. Energy Policy, Volume 35 Issue 7 (2007) Pages. 3630-3642.

This paper presents results from the international AcceptH2 study (<http://www.accepth2.com>) of acceptability and preferences for hydrogen fuel cell (FC) buses. Using the contingent valuation method, this paper compares public willingness to pay (WTP) for the air pollution reductions associated with a scenario of large-scale introduction of hydrogen (H₂) FC buses in four cities: Berlin, London, Luxembourg and Perth. Results indicate that bus users in all cities have a positive WTP for H₂ buses, and that values (adjusted to the cost of living in each city) are very similar across

geographical locations (ranging from WTP an extra €0.29 to €0.35 per single bus fare). Non-bus users were also interviewed in London and Perth, in order to capture values for the whole populations in these cities. Combined results for bus users and non-bus users confirm that overall residents in these cities are willing to pay extra (in taxes) to support the large-scale introduction of H2-buses.

IPENZ 03/65 The development and diffusion of radical technological innovation: the role of bus demonstration projects in commercializing fuel cell technology.

Harborne, P., Hendry, C. and Brown, J. Technology Analysis & Strategic Management, Volume 19 Issue 2 (March 2007) Pages 167-188.

Examines the adoption of fuel cell technology in vehicles, specifically fuel cell buses and details various projects in North America, Europe and Japan. Reviews the various stakeholder roles in the developments.

✓ **IPENZ 03/66 Production of Electricity from Proteins Using a Microbial Fuel Cell**

Jenna Heilmann and Bruce E Logan. Water Environment Research, Volume 78, Issue 5, (May 2006) Pages 531-537

Generation of electricity from proteins and protein rich wastewater (meat packing wastewater, bovine serum albumin) using a single chamber microbial fuel cell.

✓ **IPENZ 03/67 Renewable hydrogen from fuel cells at wastewater treatment plants.**

Wilson, R. and Cohan, S. BioCycle, Volume 498 Issue 2 (February 2007) Pages 41-44.

Discusses the use of wastewater methane with advanced fuel cells to produce electricity.

IPENZ 03/68 An application of real options to public and private investment in hydrogen and fuel cell technologies.

Link to resource on web

http://www.rand.org/pubs/rgs_dissertations/2007/RAND_RGSD210.pdf

✓ **IPENZ 03/69 Fuel cell systems explained** / James Larnie and Andrew Dicks. 2nd ed. Chicester, Wiley, 2003. ISBN 10047084857X

✓ **IPENZ 03/70 PEM Fuel Cells: Status and Challenges for Commercial Stationary Power Applications**

Bin Du and others.. JOM, Volume 58 Issue 8 (August 2006) Pages 45-

A potential problem is coolant leakage.

IPENZ 03/71 A tool to optimize the initial distribution of hydrogen filling stations

Transportation Research Part D: Transport and Environment, Volume 12 Issue 2 (2007) Pages 70-82.

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