

IPENZ ENGINEERING UPDATE June 2007

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Samplings from the June 2007 Issue: (Articles marked with a “√” are held in the Energy Library collection)

- Scorched earth: will environmental risks in China overwhelm its opportunities
- Policies for environmentally sustainable transport
- System for in-service strain monitoring of ordinary bridges
- Ultrasound applications in wastewater sludge pretreatment : a review
- A review of techniques for risk management in projects.
- Make your company a talent factory
- Feature focus on... green building.

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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 04/01 **The business benefits of positive leadership.**

Robison, J. Gallup Management Journal Online, 5/10/2007, p1, 5p

Discusses the results of a study to establish whether leaders who use positive leadership practices have high performing teams

√ IPENZ 04/02 **Make your company a talent factory.**

Ready, D. and Conger, J. Harvard Business Review, Volume 85 Issue 6 (June 2007) Pages 68-77.

Despite the great sums of money companies dedicate to talent management systems, many still struggle to fill key positions—limiting their potential for growth in the process. Yet there are companies that can face the future with confidence. These firms don't just manage talent, they build talent factories. The authors describe the experiences of two such corporations—consumer products icon Procter & Gamble and financial services giant HSBC Group—that figured out how to develop and retain key employees and fill positions quickly to meet evolving business needs. Though each company approached talent management from a different direction, they both maintained a twin focus on functionality (rigorous talent processes that support strategic and cultural objectives) and vitality (management's emotional commitment, which is reflected in daily actions)

√ IPENZ 04/03 **Scorched earth : will environmental risks in China overwhelm its opportunities?**

Economy, E. and Lieberthal, K. Harvard Business Review, Volume 85 Issue 6 (June 2007) Pages 88-96.

Of all the risks of doing business in China, the greatest is the threat posed by environmental degradation. And yet it's barely discussed in corporate boardrooms. This is a serious mistake. Multinationals may be more concerned with intellectual property rights violations, corruption, and potential political instability, but the Chinese government, NGOs, and the Chinese press have been focused squarely on the country's energy shortages, soil erosion, lack of water, and pollution problems, which are so severe they might constrain GDP growth. What's more, the Chinese expect the international community to take the lead in environmental protection. The bottom line: How well multinationals address environmental issues in China will affect their fortunes in one of the most important economies in the world

√ IPENZ 04/04 **How women directors succeed.**

Ghaffari, E. Corporate Board, Volume 28 Issue 163 (March/April 2007) Pages 20-25.

Discusses the results of a survey which included women on boards at at Fortune 1000 companies.

√ IPENZ 04/05 **Inner work life.**

Amabile, T. and Kramer, S. Harvard Business Review, Volume 85 Issue 5 (May 2007) Pages 72-83.

Employees have their good days and their bad days and, for the most part, the reasons for their ups and downs are unknown. Most managers simply shrug their shoulders at this fact of work life. But does it matter, in terms of performance, if people have more good days than bad days? The authors' new stream of research reveals the dramatic impact of employees' inner work lives their perceptions, emotions, and motivation levels—on several dimensions of performance.

√ IPENZ 04/06 **Reframing presentation skills development for knowledge teams.**
Light, W. Organization Development Journal, Volume 25 Issue 1 (Spring 2007) Pages 99-110.
Sharpening team presentation skills for knowledge workers who need to communicate information and knowledge to others.

Risk Management/Project Management/Cost Management/Financing/

√ IPENZ 04/07 **Predicting construction productivity using situation based simulation models.**
Choy, E. and Ruwanpura, J. Canadian Journal of Civil Engineering, Volume 33 Issue 12 (December 2006) Pages 1585-1600.

√ IPENZ 04/08 **A schedule success: Hartsfield-Jackson Atlanta Airport's runway delivered 11 Days early and \$102 million under budget.**
Sappe, R. Cost Engineering, Volume 49 Issue 4 (April 2007) Pages 21-23.

IPENZ 04/09 **Clients' goals and the construction project management process.**
Lindahl, G and Ryd, N. Facilities, Volume 25 Issue 3-4 (2007) Pages 147-156.

IPENZ 04/10 **A review of techniques for risk management in projects.**
Ahmed, A., Kayis, B. and Amornsawadwatana, S. Benchmarking, Volume 14 Issue 1 (2007) Pages 22-36.
Includes discussion of the Australian/New Zealand risk management standard AS/NZS 4360

√ IPENZ 04/11 **Relentless trending—key to effective cost & schedule management.**
Bonilla, N. AACE International Transactions, 2006, p1.1-1.7.

√ IPENZ 04/12 **Project risk management using Monte Carlo simulation..**
Khedr, M. . AACE International Transactions; (2006) Pages 2.1-2.10.

IPENZ 04/13 **The influence of partnering and procurement on subcontractor involvement and innovation.**
Eriksson, P., Dickinson, M. and Khalfan, M.M.A. Facilities, Volume 25 Issue 5-6 (2007) Pages 203-214.

Technical Aspects of Engineering –Abstracts available upon request.

√ IPENZ 04/14 **Policies for environmentally sustainable transport..**
Matsumoto, Naoko et al. International Review for Environmental Strategies, Volume 7 Issue 1 (2007) Pages 97-116.

√ IPENZ 04/15 **Benchmarking airport reconstruction projects.**

Hantziagelis, S. and McCabe, B. Canadian Journal of Civil Engineering, Volume 33 Issue 12 (December 2006) Pages 1571-1584.

IPENZ 04/16 **Use of nondestructive test deflection data for predicting airport pavement performance.**

Gopalakrishnan, K. and Thompson, M. Journal of Transportation Engineering, Volume 133 Issue 6 (2007) Pages 389-395.

√ IPENZ 04/17 **Fuel consumption, emissions estimation, and estimation, and emissions cost estimates using global positioning data.**

Agar, B, et al. Journal of the Air and Waste Management Association, Volume 57 (March 2007) Pages 348-354.

√ IPENZ 04/18 **A 21st century approach to the condition surveying of building services systems.**

Journal of Building Appraisal, Volume 2 Issue 2 (June 2006) Pages 161-170.

√ IPENZ 04/19 **Ultrasound applications in wastewater sludge pretreatment: a review.**

Khanal, S. et al. Critical Reviews in Environmental Science & Technology, Volume 37 Issue 4, (July 2007) Pages 277-313.

√ IPENZ 04/20 **World's largest municipal ultrafiltration, biologically active carbon and ozone plant prepares for startup.**

Farr, A and Stampone, P. American Water Works Association. Journal, Volume 99 Issue 5 (May 2007) Pages 54-60.

√ IPENZ 04/21 **Constructive approaches toward water treatment works sludge management: an international review of beneficial reuses.**

Babatunde, A. O and Zhao, Y. Q. Critical Reviews in Environmental Science & Technology, Volume 37 Issue 2 (March 2007) Pages 129-164.

IPENZ 04/22 **Performance indicators and multicriteria decision support for sewer asset management.**

Le Gauffre, P et al. Journal of Infrastructure Systems, Volume 13 Issue 2 (2007) Pages 105-114.

IPENZ 04/23 **Decision-support system for the rehabilitation of deteriorating sewers.**

Bairaktaris, D et al. (2007) Journal of Performance of Constructed Facilities, Volume 21 Issue 3), pp. 240-248.

IPENZ 04/24 Development and verification of a general approach to describe the efficiency of vortex separators in combined sewer systems.

Mietzel, T., Klepiszewski, K., and Weiss, G. Water Science and Technology, Volume 55 Issue 4 (2007) Pages 165-173.

IPENZ 04/25 Modelling of organic matter degradation in constructed wetlands for treatment of combined sewer overflow.

Henrichs, M et al. Science of the Total Environment, Volume 380 Issue 1-3 (2007) Pages 196-209.

IPENZ 04/26 Evidential reasoning approach for bridge condition assessment.

Wang, Y.M. and Elhag, T.M.S. Expert Systems with Applications, Volume 34 Issue 1 (2008) Pages 689-699.

IPENZ 04/27 Stochastic energy analysis of seismic isolated bridges.

Marano, G.C. and Sgobba, S. Soil Dynamics and Earthquake Engineering, Volume 27 Issue 8 (2007) Pages 759-773.

IPENZ 04/28 Monitoring of an all-composite bridge using Bragg grating sensors.

Kister, G et al. Construction and Building Materials, Volume 21 Issue 7 (2006) Pages 1599-1604.

IPENZ 04/29 System for in-service strain monitoring of ordinary bridges.

Howell, D.A. and Shenton III, H.W. Journal of Bridge Engineering, Volume 11 Issue 6 (2006) Pages 673-680.

IPENZ 04/30 Assessment of bridge remaining fatigue life through field strain measurement.

Zhou, Y.E. Journal of Bridge Engineering, Volume 11 Issue 6 (2006) Pages 737-744.

IPENZ 04/31 Feasibility of hydrogen corridors between the EU and its neighbouring countries.

Wietschel, M. and Hasenauer, U. Renewable Energy, Volume 32 Issue 13 (2007) Pages 2129-2146.

IPENZ 04/32 In search of a sustainable hydrogen economy: How a large-scale transition to hydrogen may affect the primary energy demand and greenhouse gas emissions.

Hetland, J and Mulder, G. International Journal of Hydrogen Energy, Volume 32 Issue 6 (2007) Pages 736-747.

IPENZ 04/33 A case study of flexible solutions to transport demand in a deregulated environment.

Brake, J. and Nelson, J.D. Journal of Transport Geography, Volume 15 Issue 4 (2007) Pages 262-273.

IPENZ 04/34 **An assessment of the benefits of the walking school bus in Christchurch, New Zealand.**
Kingham, S. and Ussher, S. Transportation Research Part A: Policy and Practice, Volume 41 Issue 6
(2007) Pages 502-510

√ IPENZ 04/35 **The development of environmental policy.**

King, Peter N and Mori, Hideyuki. International Review for Environmental Strategies, Volume 7 Issue
1 (2007) Pages 7-15.

√ IPENZ 04/36 **he challenges of tsunami disaster response planning and management.**

Tolentino Jr., Amado S. International Review for Environmental Strategies, Volume 7 Issue 1 (2007)
Pages 147-154.

√ IPENZ 04/37 **Fire and smoke control in naturally ventilated buildings.**

Short, C. A et al. Building Research & Information, Volume 34 Issue 1, (January/February 2006)
Pages 23-54.

√ IPENZ 04/38 **The specification: the weak link in concrete repair.**

Francis, R. Corrosion, Volume 32 Issue 2 (April 2007) Pages 19–26.

√ IPENZ 04/39 **Drying shrinkage, curling and joint opening of slabs-on-ground.**

Bissonnette, B. et al. ACI Materials Journal, Volume 104 Issue 3 (May/June 2007) Pages 259-267,

√ IPENZ 04/40 **Engineered cementitious composites with high volume fly ash.**

Wang, S. and Li, V. ACI Materials Journal, Volume 104 Issue 3 (May/June 2007) Pages 233-241.

√ IPENZ 04/41 **Long term monitoring of carbon fiber-reinforced polymer-wrapped reinforced
concrete columns under severe environment.**

Debaiky, A. et al. ACI Structural Journal, Volume 103 Issue 3 (November/December 2006) Pages
865-873.

IPENZ 04/42 **Durability based design of FRP jackets for seismic retrofit.**

Walker, R. and Karbhari, V. Composite Structures, Volume 80, Issue 4, (October 2007) Pages 553-
568.

IPENZ 04/43 **Slow crack growth and failure induced by manufacturing defects in HDPE-tubes.**

Schouwenaars, R. et al. Engineering Failure Analysis, Volume 14, Issue 6, (September 2007) Pages
1124-1134

√ IPENZ 04/44 **Understanding the basics of tap water taste.**

Burlingame, G. et al. American Water Works Association. Journal. Volume 99 Issue 5 (May 2007)
Pages 100-111.

IPENZ 04/45 **Cathodic protection of concrete structures containing calcareous aggregates in tropical humid marine environments.**

Sosa, M. et al. Anti-Corrosion Methods and Materials, Volume 54 Issue 2 (2007) Pages 103-110.

IPENZ 04/46 **Effect of inhibitor concentration and hydrodynamic conditions on the inhibitive behaviour of combinations of sodium silicate and JEDP for corrosion control in carbon steel water transmission pipes.**

Salasi, M. et al. Anti-Corrosion Methods and Materials, Volume 54 Issue 2 (2007) Pages 82-92.

IPENZ 04/47 **Potential for potable water savings by using rainwater and greywater in a multi-storey residential building in southern Brazil.**

Ghisi, E., and Ferreira, D.F. Building and Environment, Volume 42 Issue7 (2007) Pages 2512-2522.

IPENZ 04/48 **Urban Australians using recycled water for domestic non-potable use-An evaluation of the attributes price, saltiness, colour and odour using conjoint analysis.**

Hurlimann, A., and McKay, J. Journal of Environmental Management, Volume 83 Issue 1 (2007)
Pages 93-104.

IPENZ 04/49 **Rainwater tank capacity and potential for potable water savings by using rainwater in the residential sector of southeastern Brazil.**

Ghisi, E., Bressan, D.L., and Martini, M. Building and Environment, Volume 42 Issue 4 (2007) Pages 1654-1666

IPENZ 04/50 **Assessment of the risk of infection by Cryptosporidium and Giardia in non-potable reclaimed water.**

Ryu, H. et al. Water Science and Technology, Volume 55 Issue 1-2 (2007) Pages 283-290

IPENZ 04/ **Discolouration in potable water distribution systems: A review.**

Vreeburg, J.H.G. and Boxall, J.B Water Research, Volume 41 Issue 3 (2007) Pages 519-529.

IPENZ 04/51 **GIS-supported mapping of shallow geothermal potential of representative areas in south-western Germany-Possibilities and limitations.**

Ondreka, J et al. Renewable Energy, Volume 32 Issue 13 (2007) Pages 2186-2200.

IPENZ 04/52 Best practice for the assessment of defects in pipelines – corrosion.

Cosham, A., Hopkins, P. and Macdonald, K.A. Engineering Failure Analysis, Volume 14 Issue 7 (2007) Pages 1245-1265.

IPENZ 04/53 Analytical calculation of blast-induced strains to buried pipelines.

Kouretzis, G.P., Bouckovalas, G.D. and Gantes, C.J. International Journal of Impact Engineering, Volume 34 Issue 10 (2007) Pages 1683-1704.

IPENZ 04/54 Failure analysis of a crude oil pipeline.

Azevedo, C.R.F. Engineering Failure Analysis, Volume 14 Issue 6 (2007) Pages 978-994.

IPENZ 04/55 Stress corrosion failure of high-pressure gas pipeline.

Hasan, F., Iqbal, J. and Ahmed, F. Engineering Failure Analysis, Volume 14 Issue 5 (2007) Pages 801-809.

IPENZ 04/56 A GIS-based approach for the screening assessment of noise and vibration impacts from transit projects.

Hamed, M. and Effat, W. Journal of Environmental Management, Volume 84 Issue 3 (2007) Pages 305-313.

IPENZ 04/57 Analysis of regulation and policy of private toll roads in a build-operate-transfer scheme under demand uncertainty.

Chen, A. and Subprasom, K. Transportation Research Part A: Policy and Practice, Volume 41 Issue 6 (2007) Pages 537-558.

IPENZ 04/58 Competition and efficiency of private toll roads.

Xiao, F. et al. Transportation Research Part B: Methodological, Volume 41 Issue 3 (2007) Pages 292-308.

IPENZ 04/59 A case study of flexible solutions to transport demand in a deregulated environment.

Brake, J., Nelson, J.D. Journal of Transport Geography, Volume 15 Issue 4 (2007) Pages 262-273.

IPENZ 04/60 Intelligent travel: planning for the revolution.

Stewart, W. Proceedings of the Institution of Civil Engineers: Civil Engineering, Volume 160 Issue 1 (2007) Pages 39-42.

IPENZ 04/61 Effect of foundation embedment on seismic behavior of elevated tanks considering fluid-structure-soil interaction.

Livaoglu, R., and Dogangun, A. Soil Dynamics and Earthquake Engineering, Volume 27 Issue 9 (2007) Pages 855-863.

IPENZ 04/62 Seismic retrofit of a reinforced concrete flat-slab structure: Part I - seismic performance evaluation..

Hueste, M.B.D. and Bai, J.-W. Engineering Structures, Volume 29 Issue 6 (2007) Pages 1165-1177.

IPENZ 04/63 Nonlinear soil-abutment-bridge structure interaction for seismic performance-based design.

Shamsabadi, A., Rollins, K.M. and Kapuskar, M. Journal of Geotechnical and Geoenvironmental Engineering, Volume 33 Issue 6 (2007) Pages 707-720.

IPENZ 04/64 Harakeke reinforcement of soil-cement building materials: Manufacturability and properties.

Segetin, M et al. Building and Environment, Volume 42, Issue 8 (August 2007) Pages 3066-3079. Fibre from the New Zealand flax plant, Phormium tenax, or Harakeke as it is otherwise known in Maori, has been used to reinforce soil-cement composites in an attempt to improve the strength and ductility of the composite material.

IPENZ 04/65 Adaptive reuse and sustainability of commercial buildings.

Facilities, Volume 25 Issue 1-2 (2007) Pages 20-31.

SPECIAL FOCUS ON.....GREEN BUILDING

√ IPENZ 04./66 **Green on the Inside. (cover story).**

Koerth-Baker, Maggie. Consulting-Specifying Engineer, Volume 41 Issue 1 (January 2007) Pages 22-28.

Sustainable building designs for offices, which include underfloor air distribution and natural ventilation.

√ IPENZ 04./67 **The keys to marketing green building.**

Yudelson, J. Consulting Specifying Engineer, Volume 41 Issue 5 (May 2007) Pages 29-33.

First in a 3 part series on marketing sustainable design.

√ IPENZ 04./68 **High performance straw bale.**

Smith, C.R. Environmental Design and Construction, Volume 10 Issue 5 (May 2007) Pages 60-68.

The Santa Clarita Transit Maintenance Facility in California features a super-insulated building envelope constructed of straw bales. It is one of the world's first LEED-certified straw bale buildings.

IPENZ 04./69 Climate change, thermal comfort and energy: Meeting the design challenges of the 21st century.

Holmes, M. and Hacker, J. Energy and Buildings, Volume 39 Issue 7 (2007) Pages 802-814.

√ IPENZ 04./70 **Building the green way.**

Lockwood, C. Harvard Business Review, Volume 84 Issue 6 (2006) Pages 129-137.

Green building is becoming mainstream as people begin to see the financial benefits. Ten rules are outlined for building sustainably on a standard budget. Reliable building-rating systems have done much to underscore the benefits of green construction and green renovation.

√ IPENZ 04./71 **Net zero energy building case study: Science House.**

Steinbok, J et al. ASHRAE Transactions, Volume 113 Issue 1 (2007) Pages 26-35.

This cold climate architecture building uses passive solar design, daylighting, ground-source heat pumps, and photovoltaic panels to help create a zero energy building.

√ IPENZ 04./72 **Natural ventilation in nursing facility.**

Younger, M. ASHRAE Journal, Volume 48 Issue 4 (April 2007) Pages 42-47.

√ IPENZ 04./73 **Tale of two low energy designs : comparison of mechanically and naturally ventilated office buildings in temperate climates.**

Walker, C. et al. ASHRAE transactions, Volume 113 Issue 1 (2007) Pages 36-40.

Two ventilation systems in the same climate are compared. The first one is naturally ventilated without mechanical chillers, the second uses a raised floor system combined with a chilled ceiling for space conditioning.

IPENZ 04./74 **Floor shape optimization for green building design.**

Wang, W., Rivard, H., and Zmeureanu, R. Advanced Engineering Informatics, Volume 20 Issue 4) (2006) Pages 363-378.

Shape is an important consideration in green building design due to its significant impact on energy performance and construction costs. This paper presents a methodology to optimize building shapes in plan.

IPENZ 04./75 **Emergy analysis of building manufacturing, maintenance and use: Emergy building indices to evaluate housing sustainability.**

Pulselli, R.M., et al. Energy and Buildings, Volume 9 Issue 5 (2007) Pages 620-628.

In recent years, integrated building design practices based on the definition of "green building" criteria as common standards of measurement have been promoted. For example, Green Building Rating Systems such as LEED (US) and BREEAM (UK) provide national standards for developing high-performance sustainable buildings. However, integrated environmental accounting methods and global sustainability indicators are still required to evaluate the general environmental performances of buildings, because housing is greatly concerned with global environmental problems such as the use of non-renewable energy, the overexploitation of materials, the exhaustion of resources and the wasting of energy. In this work, an emergy (spelled with an "m") analysis has been applied to a building to account for the main energy and material inflows to the processes of building manufacturing, maintenance and use. Building materials, technologies and structural elements have been measured and compared to each other in order to evaluate their impacts and to provide a basic calculation that may be used for evaluation and selection.

IPENZ 04./76 Towards green buildings: Glass as a building element - The use and misuse in the gulf region.

Aboulnaga, M. Renewable Energy, Volume 31 Issue 5 (2006) Pages 631-653.

In the last decade, total glazed building's facades became the icon of Dubai. This large area of glazing in each facade needs protection against overheating and sun glare in summer. According to leader in energy and environmental design (LEED) glass selection becomes a main element in this equation to contribute towards achieving a green building.

IPENZ 04./77 Solar integrated energy system for a green building.

Zhai, X. et al. Energy and Buildings, Volume 39 Issue 8 (2007) Pages 985-993.

Shanghai is characteristic of subtropical monsoonal climate with the mean annual temperature of 17.6 °C, and receives annual total radiation above 4470 MJ/m² with approximately 2000 h of sunshine. A solar energy system capable of heating, cooling, natural ventilation and hot water supply has been built in Shanghai Research Institute of Building Science. After 1-year operation, it is confirmed that the solar system contributes 70% total energy of the involved space for the weather conditions of Shanghai.

IPENZ 04./78 Decision support for natural ventilation of nonresidential buildings.

Zhao, Y. and Jones, J. Journal of Architectural Engineering, Volume 13 Issue 2 (2007) Pages, pp. 95-104.

IPENZ 04./79..mproving natural ventilation in combined solar house with solar chimney and solar water collector.

Zhou, X. et al. Journal of the Energy Institute, Volume 80 Issue 1 (2007) Pages 55-59.

IPENZ 04./80 Guidelines for improving natural daytime ventilation in an office building with a double-skin façade.

Gratia, E. and De Herde, A Solar Energy, Volume 81 Issue 4 (2007) Pages 435-448.

IPENZ 04./81 Exploiting a hybrid environmental design strategy in a US continental climate.

Short, C. and Lomas, K. Building Research & Information, Volume 35 Issue 2 (March 2007) Pages 119-143.

A proposed hybrid strategy for a new library building which exploits mid season opportunities for using natural buoyancy-driven displacement ventilation and passive cooling.

√IPENZ 04./82 Buidings that breathe.

Deneen, S. and Howard, B. E : the Environmental Magazine., Volume 18, Issue.1 (January/February 2007) ; Pages 26-

Commercial and residential buildings in the U.S. are estimated to consume 65 percent of all electricity , 12 percent of drinking water and 40 percent of all raw materials. Green building is the new focus. The recently opened 46 story glass and steel Hearst Tower, required 20 percent less steel and was made of 90 percent recycled material.