

IPENZ ENGINEERING UPDATE April 2007

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Samplings from the April 2007 Issue:

- Feature focus... on airports
- Implementing risk management on transit mega projects.
- Heat exchangers in carbon dioxide cascade systems.
- Competitive advantage on a warming planet.
- Effects of seabed instability on offshore fixed platforms.
- State of the art methods for measuring water in landfills
- Sleep deficit : the performance killer
- Handbook of biomass gasification

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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 02/01 **Competitive advantage on a warming planet.**

Lash, J and Wellington, F. Harvard Business Review, Volume 85, Issue 3 (March 2007) Pages 94-102.

Reviews the impact of climate change/global warming issues on business activities, competitive advantage, finances and decision making. Proposes a four step approach to responding to the risk of climate change, including quantifying the company's carbon footprint.

✓IPENZ 02/02 **Achieving marketing objectives through social sponsorships.**

Simmons, Carolyn J. and Becker-Olsen, K.L. Journal of Marketing., Volume 70, Issue 4 (October 2006) Pages 154-169.

Previous literature on corporate social responsibility has failed to demonstrate the influence of social sponsorships when it comes to highlighting a company's point of difference and a brand's positioning. The authors explain the importance of selecting an appropriate sponsored cause but also show that negative effects of a less appropriate fit can be moderated with intelligent communications decisions.

✓IPENZ 02/03 **Reputation and its risks.** Eccles, R.G. et al. Harvard Business Review, Volume 85 Issue 2, (February 2007) Pages 104-114.

Regulators, industry groups, consultants, and individual companies have developed elaborate guidelines over the years for assessing and managing risks in a wide range of areas, from commodity prices to natural disasters. Yet they have all but ignored reputational risk, mostly because they aren't sure how to define or measure it. That's a big problem, say the authors. Because so much market value comes from hard-to-assess intangible assets like brand equity and intellectual capital, organizations are especially vulnerable to anything that damages their reputations. The process outlined in this article will help managers do a better job of assessing existing and potential threats to their companies' reputations and deciding whether to accept a particular risk or take actions to avoid or mitigate it.

✓IPENZ 02/04 **A practical experience of using competency-related pay.**

Conca, J. Competency and Emotional Intelligence, Volume 13, Issue 4 (Summer 2006) Pages 24-28.

The author argues that Utility company Union Fenosa's experience of using a competency framework to integrate its rewards systems with its other HR practices casts doubt on the perceived wisdom that pay and competencies should not mix

✓IPENZ 02/05 **How Managers' Everyday Decisions Create or Destroy Your Company's Strategy.**

Bower, J. et al. . Harvard Business Review, Volume 85 Issue 2, (February 2007) Pages 72-79

Senior executives have long been frustrated by the disconnection between the plans and strategies they devise and the actual behaviour of the managers throughout the company. This article approaches the problem from the ground up, recognizing that every time a manager allocates

resources, that decision moves the company either into or out of alignment with its announced strategy.

✓IPENZ 02/06 **Sleep deficit: The performance killer**

Charles A Czeisler. Harvard Business Review, Volume 84 Issue 10 (2006) Pages 53-59, 148.
Long hours and traveling often in multiple time zones, do not lead to high performance. The four neurobiological functions that effect sleep duration and quality and high performance are outlined. Recommendations for corporate sleep policies are discussed

Risk Management/Project Management/Cost Management/Financing/

IPENZ 02/07 **Quality and timeliness in highway construction contracts: a new acceptance model based on both mechanical and surface performance of flexible pavements**

Praticó, F.G. Construction Management & Economics, Volume 25 Issue 3, (March 2007) Pages 305-313

Key factors in modern road projects are timely completion and high performance. This paper discusses a model for the determination of pay adjustment on the basis of quality and timeliness.

✓IPENZ 02/08 **The hold-up problem in the management of construction projects: A case study of the Channel Tunnel**

Chen-Yu Chang and Ive, G International Journal of Project Management, Volume 25, Issue 4, May 2007, Pages 394-404

Transaction hazards can occur due to hold-up problems within the context of asset specificity, and it is essential that managers have a sound understanding of this problem. The current study sought to analyze three major disputes from the Channel Tunnel project (1988-94) by applying transaction cost economics (TCE). Process specificity is identified as a special form of asset specificity for construction projects and can provide extra insights into the reasons for hold-up problems. Ungovernable uncertainty, degree of lock-in and amount of money under dispute are identified as three parameters. It is then shown that the observed connection between the TCE model's specification of bargaining power and dispute resolution outcomes reflect theoretical predictions. The study recommends that clients should not over-rely on the protective strength of lump-sum contracts and that in some circumstances hold-up problems can be viewed as both serious and unsolved by the administrative structures and governance that are in place

✓IPENZ 02/09 **Construction Management–Presumed Dead But Still Alive.**

Abi-Karam, Talal. AACE International Transactions; 2006, p2.1-2.6, 6p

Discussion on construction management and key risks including costs and project duration.

✓IPENZ 02/10 **Structuring the project environment for learning**

Sense, A.J. International Journal of Project Management, Volume 25, Issue 4, May 2007, Pages 405-412

This paper promotes the creation and maintenance of supportive situated learning environments within projects to facilitate project learning as well as developing learning competency in project practitioners.

✓IPENZ 02/11 **Implementing Risk Management on Transit Mega-Projects**

Kildare, Shawnv Blank, George P

AACE International Transactions; 2006, p3.1-3.5.

Use of a risk assessment tool to manage some high profile transit mega projects in the New York city area.

✓IPENZ 02/12 **Staffing approach and conditions for collective learning in project teams: The case of new product development projects**

Bourgeon, L. International Journal of Project Management, Volume 25, Issue 4, May 2007, Pages 413-422

The current competitive environment means it becomes essential that companies master, promote and hold on to the collective learning that occurs during projects to develop new products. The study discusses how the collective learning conditions during such projects can be influenced by the staffing of the teams and the career development of project managers. The study finds that job rotation for functional staff can contribute to favourable collective learning conditions.

✓IPENZ 02/13 **Stakeholder impact analysis in construction project management**

Olander, S. Construction Management & Economics, Volume 25 Issue 3 (March 2007) Pages ,277-287

A range of stakeholders, whose needs and expectations may conflict and may not necessarily be realizable, can be expected to be involved in construction projects. The stakeholder management process should be based on stakeholder analysis and entails evaluating the needs and expectations as they relate to the principal objectives of the project. Drawing on established theory, knowledge of stakeholder management and empirical data, this paper posits a stakeholder impact index. This determines the nature and impact of stakeholder influence, how probably it is that stakeholders will exercise their influence and how each stakeholder's position relates to the project – are they for or against it? By analyzing the stakeholder impact index, project managers can more easily formalize a stakeholder management process.

Technical Aspects of Engineering

✓IPENZ 02/14 / **Statutory control of indoor natural ventilation concerning radon level and health.**

Chan, E. et al. Structural Survey, Volume 24, Issue 2 (2006) Pages 114-

✓IPENZ 02/15 **Hydrogeotechnical characterization of a metallurgical waste.**

Rodriguez, R. Canadian Geotechnical Journal, Volume 43, Issue 10 (October 2006) Pages 1042-

✓IPENZ 02/16 **Heat exchangers in carbon dioxide cascade systems.**

Stenhede, C. IRHACE journal, Volume 19 Issue 2 (March/April 2007) Pages 6-13.

√IPENZ 02/17 **Using heat pipe heat exchangers for reducing energy consumption of treating ventilation air in an operating theatre in tropical environment : a simplified model.**

Yau, Y. Building Services Engineering Research & Technology, Volume 27, Issue 4 (November 2006) Pages 297-310.

IPENZ 02/18 **Chloride penetration in RC-structures in marine environment – Long term assessment of a preventive hydrophobic treatment**

Schueremans, L. et al. Construction and Building Materials, Volume 21, Issue 6, (June 2007) Pages 1238-1249

IPENZ 02/19 **The changing topography of corroding mild steel surfaces in seawater**

Jeffrey, R. and Melchers, R. Corrosion Science, Volume 49, Issue 5 (May 2007), Pages 2270-2288

√IPENZ 02/20 **Thermally sprayed aluminum and zinc coatings for tidal zone cathodic protection of offshore platform pile legs**

Li, Y. Materials Performance, Volume 45, Issue 12 (2006) Pages 16-19.

IPENZ 02/21 **Effect of seabed instability on fixed offshore platforms**

Mostafa, Y. and El Naggar, H. Dynamics and Earthquake Engineering, Volume 26, Issue 12 (December 2006), Pages 1127-1142

√IPENZ 02/22 **Identification of failure mechanisms of road embankments due to liquefaction : optimal corrective measures at seismic sites.**

López-Querol, S and Blázquez, R, Canadian Geotechnical Journal, Volume 43, Issue 9 (September 2006) Pages 889-

IPENZ 02/23 **Performance study of a bridge involving sliding decks and pounded abutment during a violent earthquake**

Engineering Structures, Volume 29, Issue 5 (May 2007), Pages 802-812

IPENZ 02/24 **Feasibility study of hybrid retrofits to an isolated off-grid diesel power plant**

Rehman, S. et al. Renewable and Sustainable Energy Reviews, Volume 11, Issue 4 (May 2007) Pages 635-653

IPENZ 02/25 **Durability based design of FRP jackets for seismic retrofit**

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

IPENZ 02/26 **Identification of critical locations across multiple infrastructures for terrorist actions**

Patterson, S and Apostolakis, G. Reliability Engineering & System Safety, Volume 92, Issue 9 (September 2007) Pages 1183-1203

IPENZ 02/27 Safeguarding information intensive critical infrastructures against novel types of emerging failures

Balducelli, C. et al. Reliability Engineering & System Safety, Volume 92, Issue 9 (September 2007)
Pages 1218-1229

IPENZ 02/28 Congestion and variable user charging as an effective travel demand management instrument

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

IPENZ 02/29 Feasibility analysis of an active technology to improve acoustic comfort in buildings

Naticchia, B and Carbonari, A. Building and Environment, Volume 42, Issue 7 (July 2007) Pages 2785-2796

IPENZ 02/30 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, July 2007, Pages 537-558

IPENZ 02/31 The climate's long-term impact on New Zealand infrastructure (CLINZI) project—A case study of Hamilton City, New Zealand

Jollands, M et al. Journal of Environmental Management, Volume 83, Issue 4, June 2007, Pages 460-477

IPENZ 02/32 Biofuels (alcohols and biodiesel) applications as fuels for internal combustion engines.

Agarwal, A. Progress in Energy and Combustion Science, Volume 33, Issue 3, June 2007, Pages 233-271

√IPENZ 02/33 Strategies for the deployment of micro-generation: Implications for social acceptance

Sauter, R and Watson, J. Energy Policy, Volume 35, Issue 5, (May 2007) Pages 2770-2779

IPENZ 02/34 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 (May 2007)
Pages 736-747

IPENZ 02/35 Promoting bike-and-ride: The Dutch experience

Martens, K. Transportation Research Part A: Policy and Practice, Volume 41, Issue 4 (May 2007)
Pages 326-338

IPENZ 02/36 Underground landscape: The urbanism and infrastructure of Toronto's downtown pedestrian network

Belanger, P. Tunnelling and Underground Space Technology, Volume 22, Issue 3 (May 2007) Pages 272-292

IPENZ 02/37 Assessing impacts of urban freight measures on air toxic emissions in Inner Sydney
Marquez, L and Salim, V.

Environmental Modelling & Software, Volume 22, Issue 4 (April 2007) Pages 515-525

IPENZ 02/38 Four years of practical experience with an Integrated Membrane System (IMS) treating estuary water

van Agtmaal, J. Desalination, Volume 205, Issues 1-3 (5 February 2007) Pages 26-37

IPENZ 02/39 Aquapot: UF real applications for water potabilization in developing countries. Problems, location and solutions adopted

Arnal, J. et al. Desalination, Volume 204, Issues 1-3 (5 February 2007) Pages 316-321

IPENZ 02/40 Sustainability and membrane processing of wastewater for reuse

Fane, A. Desalination, Volume 202, Issues 1-3 (5 January 2007) Pages 53-58

IPENZ 02/41 Review of state of the art methods for measuring water in landfills

Imhoff, P. et al. Waste Management, Volume 27, Issue 6 (2007) Pages 729-745

IPENZ 02/42 Use of inert C&D materials for seawall foundation: Quality control measures

Yeung, A.T. et al. Waste Management, Volume 27, Issue 6 (2007) Pages 768-777

IPENZ 02/43 A tool for prioritizing multinational transport infrastructure investments

Tsamboulas, D.A. Transport Policy, Volume 14, Issue 1 (January 2007) Pages 11-26

IPENZ 02/44 Economic impact of the introduction of the German HGV toll system

Doll, C and Schaffer, A. Transport Policy, Volume 14, Issue 1 (January 2007) Pages 49-58

IPENZ 02/45 Sustainable public transport systems: Moving towards a value for money and network-based approach and away from blind commitment

Hensher, D.A. Transport Policy, Volume 14, Issue 1 (January 2007) Pages 98-102

IPENZ 02/46 A review of wind energy technologies

Herbert, J. et al. Renewable and Sustainable Energy Reviews, Volume 11, Issue 6 (2007) Pages 1117-1145.

IPENZ 02/47 **Spectators' aerothermal comfort assessment method in stadia**
Szucs, A et al. Building and Environment, Volume 42, Issue 6 (2007) Pages 2227-2240.

√IPENZ 02/48 **Temperature & temperament: A psychologist looks at comfort**
ASHRAE Journal, Volume 49, Issue 2 (2007) Pages 14-22.

√IPENZ 02/49 **A method for assessing the acceptability of noise levels in air-conditioned offices.**
Mui, K and Wong, L. Building Services Engineering Research and Technology, Volume 27, Issue 3 (2006) Pages 249-254

IPENZ 02/50 **A review of climate change impacts on the built environment**
Wilby, R.L. Built Environment, Volume 33, Issue 1 (2007) Pages 31-45.

IPENZ 02/51 **Geological and historical records of tsunami in Australia**
Dominey-Howes. Marine Geology, Volume 239, Issue 1-2 (2007) Pages 99-123.

IPENZ 02/52 **Impact of great december 26, 2004 sumatra earthquake and Tsunami on structures in port blair**
Kaushik, H.B. and Jain, S.K. Journal of Performance of Constructed Facilities, Volume 21, Issue 2 (2007) Pages 128-142.

Books from the Energy Library Collection

IPENZ 02/53 **Handbook Biomass Gasification** Knoef, Harrie (ed.) (2005) Enschede: Biomass Technology Group
This handbook is designed for both newcomers to the industry and those familiar with the industry. It is the final handbook of the Gasnet project sponsored by the European Commission and Novem. Chapters have been written by specialists, and cover a wide range of topics, such as Success stories on biomass gasification, and Public perception and social marketing of new biomass conversion technologies, as well as detailed technical material.

IPENZ 02/54 **Stress Free for Good: 10 scientifically proven life skills for health and happiness**
Luskin, Fred and Pelletier, Kenneth (2005) New York: Harper Collins
If you're stressed about the end of oil or anything else for that matter then this book may be of interest to you. Each chapter introduces a life skill for stress management (belly breathing, muscle tensing and relaxing, visualisation etc). Forward by Andrew Weil M.D.

IPENZ 02/55 **The ten faces of innovation: Strategies for heightening creativity.** (2006) Kelley, Tom; Littman, Jonathan. London: Profile Books Ltd.

Using examples that have already worked in the real world, this author looks at different types of personality and how they can be encouraged in the business world. An example is the Cross Pollinator: a person or firm who shares their insights and ideas. This is an easily-read book by an author who has built a company using these principles.

IPENZ 02/56 **An inconvenient truth: the planetary emergency of global warming and what we can do about it.** (2006) Al Gore. London: Bloomsbury

The increasing awareness of global warming and its effect on our planet and the future of man has become one of the great crusades of our age. This book is designed for a wide readership; there are many photographs and the facts come in easily digested sections.

IPENZ 02/57 **Hard facts, dangerous half-truths, and total nonsense: Profiting from evidence-based management.** (2006) Jeffrey Pfeffer. Boston: Harvard Business School Press.

Organizations frequently do not look closely enough at their management practices, and instead of making worthwhile change, often merely repeat the mistakes of other firms and organizations. This book aims to help management scrutinize what they do, and review intended change, so that real and worthwhile progress is made.

SPECIAL FOCUS ON.....Airports

IPENZ 02/59 **The impacts of emerging aviation trends on airport infrastructure**

Forsyth, P. Journal of Air Transport Management, Volume 13, Issue 1 (January 2007) Pages 45-52.

IPENZ 02/60 **Airports and economic development**

Green, R.K. Real Estate Economics Volume 35, Issue 1 (2007) Pages 91-112

Discusses the theory that airport activity helps to predict population and employment growth in a metropolitan area. Concludes that passenger activity is an indicator of growth, but cargo activity is not.

✓IPENZ 02/61 **Investment incentives and airport regulation**

Starkie, D. Utilities Policy, Issue 4 (December 2006) Pages 262-265

Explores the argument that privatized utilities tend to under-invest in airport infrastructure.. Concludes that airport companies have actually inclined towards over-investment..

✓IPENZ 02/62 **Capital efficiency at airports and related services**

Holt, D. et al.

Utilities Policy, Volume 14, Issue 4 (December 2006) Pages 251-261

IPENZ 02/63 **Prediction of atmospheric dispersion of pollutants in an airport environment**
Das, S.K. and Durbin, P. .Atmospheric Environment, Volume 41, Issue 6 (2007) Pages 1328-1341

IPENZ 02/64 **Predicting the stand-up time of temporary London Clay slopes at Terminal 5, Heathrow Airport**
Kovacevic, N. et al. Geotechnique, Volume 57, Issue 1 (2007) Pages 63-74.

IPENZ 02/65 **Objective measurement of the quality of airport lighting whilst in service**
McMenemy, and Dodds, K. Transactions of the Institute of Measurement and Control, Volume 28 Issue 4 (2006) Pages. 353-369.

IPENZ 02/66 **Environmental and operational sustainability of airports: core indicators and stakeholder communication,**
Upham, P. and Mills, J. Benchmarking: an International Journal, Volume 12, Issue 2 (2006) Pages 1566-179.

IPENZ 02/67 **Mapping of permafrost surface using ground-penetrating radar at Kangerlussuaq Airport, western Greenland**
Jorgensen, A.S and Andreasen, . Cold Regions Science and Technology, Volume 48, Issue (April 2007) Pages 64-72

IPENZ 02/68 **Energy saving in airports by trigeneration. Part I: Assessing economic and technical potential**
Cardona< E. et al Applied Thermal Engineering, Volume 26, Issues 14-15, (October 2006), Pages 1427-1436

IPENZ 02/69 **Energy saving in airports by trigeneration. Part II: Short and long term planning for the Malpensa 2000 CHCP plant**
Cardona, E. et al Applied Thermal Engineering, Volume 26, Issues 14-15, October 2006), Pages 1437-1447

IPENZ 02/70 **Sealing system selection for jointed concrete pavements – A review**
Brigitte Odum-Ewuakye and Nii Attah-Okine . Construction and Building Materials, Volume 20, Issue 8, October 2006, Pages 591-602

IPENZ 02/71 **PVD ground improvement with vacuum preloading at Suvarnabhumi Airport**
Cortlever, N. et al. Geotechnical Engineering, Volume 37, Issue 3 (2006) Pages 189-194.