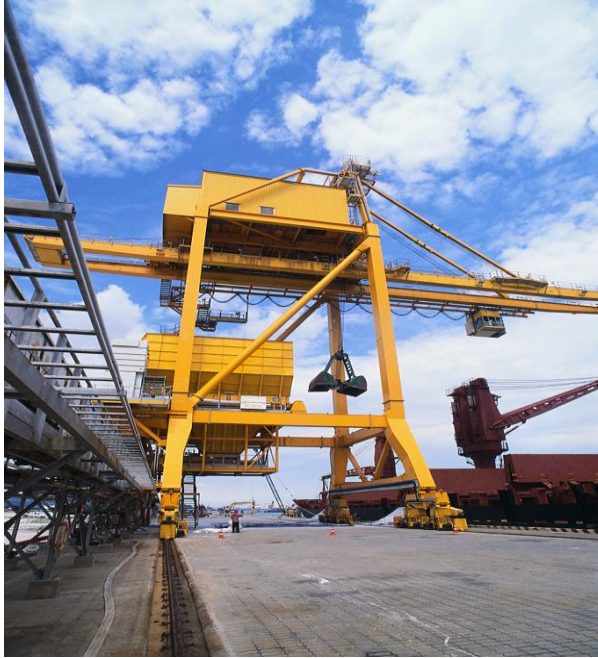


## IPENZ ENGINEERING UPDATE September 2008



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### Samplings from this Issue

- The new science of super performance.
- Shaping strategy in a world of constant disruption.
- What have we learned? Themes from the literature on best-practice benchmarking.
- Web-based electronic bidding United Kingdom, practical experience.
- Industrial floor design, construction and testing.
- Real time passenger information.
- Improving asset corrosion management using KPIs.

### ► Special Focus on Risk Management

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

### √IPENZ 18/01 **Keep young electrical engineers grounded.**

Floyd, H. Consulting Specifying Engineer (February 2008) Pages 33-35.

Past models for mentoring design engineers in electrical safety are not adequate for the future. Trends shaping the role of design processes will expand the role and value of the electrical design engineer.

### √IPENZ 18/02 **UK Civil engineering education in the twenty-first century.**

Barr, B. .Proceedings of the Institution of Civil Engineers : Management, Procurement and Law, Volume 161 Issue MP1 (February 2008) Pages 17-23.

### √IPENZ 18/03 **Mentoring HVAC engineers : tips that you didn't learn in an engineering school.**

Scruby, T. Consulting Specifying Engineer (May 2008) Pages 30-34.

### √IPENZ 18/04 **The new science of super performance.**

Guerra, D. Industrial Management, Volume 50 Issue 2 (March-April 2008) Pages 20-25.

Superperformance is described as a prolonged period of exceeding ROI –at least 12 years. This article discusses the common denominators in the companies that achieve this level of performance.

### √IPENZ 18/05 **The industry's perspective on workforce planning for major projects.**

Rankin, L., Sloodman, T and Jergeas, P. AACE International Transactions (2008) Pages 1-12.  
Peer reviewed paper.

### √IPENZ 18/06 **Firing back : how great leaders rebound after career disasters.**

Sonnenfeld, J and Ward, A Organizational Dynamics, Volume 37 Issue 1 (January 2008) Pages 1-20.

### √IPENZ 18/07 **Briefing: Tracking site staff with wireless technology.**

Manning, J. Proceedings of the Institution of Civil Engineers : Management, Procurement and Law, Volume 161 Issue MP1 (February 2008) Pages 1-2.

The temporary and constantly changing nature of construction sites creates special challenges that are not found in other industries. The site itself transforms daily, the workers even change from day to day as phases get completed and different subcontractors come and go. Some of the ways in which the latest wireless time and attendance technology can help to monitor staff and maintain site security are described in this article.

Abstract reprinted with the permission of Thomas Telford Limited:

[http://www.ice.org.uk/services/services\\_journals.asp](http://www.ice.org.uk/services/services_journals.asp)

**√IPENZ 18/08 What was privacy?**

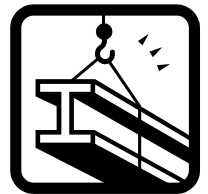
McCreary, L. Harvard Business Review, Volume 86 Issue 10 (October 2008) Pages 123-131.  
Why is that question in the past tense? Because individuals can no longer feel confident that the details of their lives – from identifying numbers to cultural preferences – will be treated with discretion rather than exploited. Even as Facebook users happily share the names of their favourite books, movies, songs, and brands, they often regard marketers' use of that information as an invasion of privacy. This article examines numerous facets of the privacy issue, from Google searches, public shaming on the internet, and cell phone etiquette to passenger screening devices, public surveillance cameras, and corporate chief privacy officers.

**√IPENZ 18/09 Approach to business continuity planning as part of disaster management.**

McDonald, R. Natural Gas & Electricity, Volume 23 Issue 8 (March 2007) Pages 7-11.  
Discusses the preparation of disaster management plans, using public utilities as the example. Reviews the three key areas to cover and looks at previous disasters for lessons learned.

**√IPENZ 18/10 Does your crisis planning lack strategic focus?**

Security Director's Report, Volume 8 Issue 7 (July 2008)

**√IPENZ 18/11 The performance measurement of cause-related marketing by balance scorecard.**

Wu, S and Hung, J. Total Quality Management & Business Excellence, Volume 18 Issue 7 (September 2007) Pages 771-791.

**√IPENZ 18/12 Framing high-performance logistics.**

Vasiljevic, D and Popadic, R. Industrial Management, Volume 50 Issue 4 (July 2008) Pages 26-30.  
Discusses the integration of procurement, transport, warehousing, distribution and maintenance into one high quality control system.

**√IPENZ 18/13 Reflecting on downsizing: what have managers learned?**

Gandolfi, F. SAM Advanced Management Journal, Volume 73 Issue 2, (Spring 2008) Pages 46-55.

**√IPENZ 18/14 Shaping strategy in a world of constant disruption.**

Hagel, J., Brown, J and Davison, L.

Harvard Business Review, Volume 86 Issue 10 (October 2008) Pages 80-89.

Redefining the terms of competition for a market sector, an industry, or an entire global ecosystem is a tall order. It means attracting thousands of participants, galvanizing their efforts, and retaining their commitment for the long haul. Hagel, Brown, and Davison, of the Deloitte Center for Edge Innovation, provide a blueprint for this daunting task of shaping strategy as technology-driven infrastructures constantly change. The authors discuss three elements that, no matter the industry, are vital in shaping strategy.

√**IPENZ 18/15 How to Protect Your Job in a Recession.**

Banks, J and Coutu, D. Harvard Business Review, Volume 86 Issue 9 (September 2008) Pages 113-116.

√**IPENZ 18/16 Linkages of project environment to performance: lessons for team leadership.**

Thamhain, Hans J. International Journal of Project Management, Volume 22 Issue 7 (October 2004) Pages 533-544.

This field study of 76 technology-based project teams examines the influences of the project environment on team performance. The results show that in spite of cultural differences among organizations a general agreement exists on the factors that drive team performance. One of the most striking findings is the large number of performance factors that is derived from the human side. Organizational components that satisfy personal and professional needs seem to have a strong effect on cooperation, commitment, risk management, and ultimately drive overall team performance. Other influences are derived from the organizational process, which often have their locus outside the project organization. The findings help to better understand the linkages between team environment and performance, and more effectively manage project teams, especially in complex work environments.

√**IPENZ 18/17 What have we learned? Themes from the literature on best-practice benchmarking.**

Francis, G and Holloway, J. International Journal of Management Reviews, Volume 9 Issue 3 (September 2007) Pages 171-189.

The article outlines benchmarking. The authors argue that most of the current literature is descriptive or prescriptive and there is a scarcity of critical analysis. Additionally the long term perspectives have been largely ignored. They suggest future areas of research on the topic.

√**IPENZ 18/18 Avoiding the mistakes of the past : lessons learned on what makes or breaks quality initiatives.**

Jacobsen, J. Journal for Quality & Participation, Volume 31 Issue 2 (Summer 2008) Pages 4-8.

√**IPENZ 18/19 Using a unified risk management approach for EH&S and security: results of a pilot project.**

Grosskopf, John, Milliman, John and Lando, Dan. Environmental Quality Management, Volume 17 Issue 1 (Fall 2007) Pages 3-16.

√**IPENZ 18/20 Web-based electronic bidding United Kingdom, practical experience.**

Maritn, J. AACE International Transactions (2008 Pages) IT.03.1- IT.03.11

## Technical Aspects of Engineering

√**IPENZ 18/21 Industrial floor design, construction and testing.**

Dapeng, Qui. The Structural Engineer, Volume 86 Issue 8 (15 April 2008) Pages 29-37.

√IPENZ 18/22 **The impact of modelling and simulation technology on engineering problem solving.**  
Dodgson, M., David M. and Salter, A. Technology Analysis & Strategic Management, Volume 19 Issue 4 (July 2007) Pages 471-489.

A project failure costs can be highly expensive, and use of tools such as modelling and simulation is increasing. This paper discusses how use of these technologies can help engineers in the design and development of engineering projects.

√IPENZ 18/23 **Reinforced concrete jacketing-interface influence on cyclic loading response.**  
Júlio Eduardo, N B S and Branco, Fernando A B. ACI Structural Journal, Volume 105 Issue 4 (July/August 2008) Pages 471-447.

√IPENZ 18/24 **Award of excellence: Clyde N. Baker Jr. Down-to-earth engineer takes lessons learned at the birthplace of the skyscraper to put world skylines on firmer ground.**  
ENR (7/14 April 2008) Pages 36-43.  
Focus on efficient foundations for tall buildings.

√IPENZ 18/25 **Sustainable concrete waste recycling.**  
Doshio, Y. Proceedings of the Institution of Civil Engineers : Construction Materials, Volume 161 Issue CM2 (May 2008) Pages 47-62.

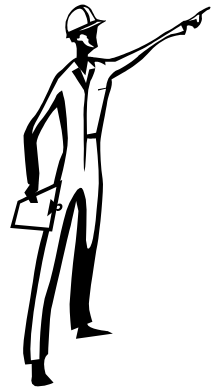
√IPENZ 18/26 **Sulfate-resistant concrete utilizes waste fly ash.**  
Materials Performance, Volume 47 Issue 5 (May 2008) Pages 17-19.  
Use of waste fly ash from power generation plants.

√IPENZ 18/27 **The ShakeOut San Andreas Earthquake Scenario: Preparing for a Catastrophe.**  
Collins, L. Fire Engineering, Volume 161 Issue 9 (September 2008) Pages 75-83.

√IPENZ 18/28 **Building even better concrete.**  
Gonchar, C. ENR, 17 December (2007) Pages 45-50.  
Discusses industry endeavours to reduce the environmental footprint of concrete. Continuing education feature which includes learning objectives and a questionnaire at conclusion of article.

√IPENZ 18/29 **Pedestrian-induced vibrations of the Clifton Suspension Bridge, UK.**  
MacDonald, J. Proceedings of the Institution of Civil Engineers : Bridge Engineering, Volume 161 Issue BE2 (June 2008) Pages 69-77.

√IPENZ 18/30 **Health assessment and maintenance strategy for bridge management systems: lessons learned in Taiwan.**  
Journal of Infrastructure Systems, Volume 13, Issue 3 (September 2007) Pages 235-246.



√**IPENZ 18/31 Seismic performance assessment of simply supported and continuous multispan concrete girder highway bridges.**

Nielson, B and DesRoches, R. Journal of Bridge Engineering, Volume 12 Issue 5 (September 2007) Pages 611-620.

Results from this research show risk areas in reinforced concrete columns, abutments and in unseating of girders.

√**IPENZ 18/32 Environmental life-cycle assessment of railway track beds.**

Kiania, M., Parry, T and Ceney, H. Proceedings of the Institution of Civil Engineers : Engineering Sustainability, Volume 161 Issue ES2 (June 2008) Pages 135-142.

√**IPENZ 18/33 Solid waste generation in asphalt and reinforced concrete roadway life cycles.**

Rajendran, S and Gambatese, J. Journal of Infrastructure Systems, Volume 13, Issue 2 (June 2007) Pages 88-96.

√**IPENZ 18/34 Generating biomass fuel from disaster debris.**

Yepsen, R. BioCycle, Volume 49 Issue 7 (July 2008) Pages 51-55.

√**IPENZ 18/35 Bioenergy innovations: the case of wood pellet systems in Sweden.**

Mahapatra, K., Gustavsson, L and Madlener, R. Technology Analysis & Strategic Management, Volume 19 Issue 1 (January 2007) Pages 99-125.

√**IPENZ 18/36 Outdoor site-lighting performance: a comprehensive and quantitative framework for assessing light pollution.**

Brons, J., Bullough, J and Rea M. Lighting Research and Technology, Volume 40 Issue 3 (September 2008) Pages 201-220.

√**IPENZ 18/37 Performance of ultraviolet germicidal irradiation lamps and luminaires in long-term service.**

First, M., Banahan, K and Dumyah, T. Leukos, Volume 3 Issue 3 (January 2007) Pages 181-188.

√**IPENZ 18/38 Effect of ultraviolet germicidal lights installed in office ventilation systems on workers' health and wellbeing: double-blind multiple crossover trial.**

Menzies, D et al. The Lancet, Volume 362 Issue 9398 (29 November 2003) Pages 1785-91.

√**IPENZ 18/39 Improving asset corrosion management using KPIs.**

Morshed, Ali. Materials Performance, Volume 47 Issue 5 (May 2008) Pages 50-54.

√IPENZ 18/40 **Measuring maintenance performance using a balanced scorecard approach.**

Alsyouf, Imad. Journal of Quality in Maintenance Engineering, Volume 12 Issue 2 (2006)

√IPENZ 18/41 **Sustainable groundwater-source cooling systems for buildings.**

Proceedings of the Institution of Civil Engineers : Engineering Sustainability, Volume 161 Issue ES2 (June 2008) Pages 123-133.

√IPENZ 18/42 **Combining intermodal transport with electric vehicles : towards more sustainable solutions.**

MacHarris, C., Van Mierlo, J and Can Den Brossche, P. Transportation Planning & Technology, Volume 30 Issue 2/3 (April 2007) Pages 311-323.

√IPENZ 18/43 **Real time passenger information.**

Holdsworth, N., Enoch, M and Ison, S. Transportation Planning & Technology, Volume 30 Issue 2/3 (April 2007) Pages 183-204.

√IPENZ 18/44 **Transients in natural ventilation - a time-periodically-varying source.**

Bolster, Diogo and Caulfield, C. P. Building Services Engineering Research & Technology, Volume 29 Issue 2 (May 2008) Pages 119-126

√IPENZ 18/45 **Low-Temperature Heat Storage for Solar Heating and Cooling Applications.**

Schweigler, Christian, Hiebler, Stefan, Keil, Christian, Köbel, Holger, et al. ASHRAE Transactions, Volume 113 Part 1 (2007) Pages 89-96

√IPENZ 18/46 **Hydrodynamic modelling of estuarine flood defence realignment as an adaptive management response to sea-level rise.**

French, J R. Journal of Coastal Research, Volume 24 Issue 2B (March 2008) Pages 1-12.

√IPENZ 18/47 **Defending Corpus Christi (Flood protection)**

Civil Engineering, Volume 78 Issue 6 (June 2008) Pages 48-53, 80-81.  
Steel sheet pile walls are erected on either side of a seawall.

√IPENZ 18/48 **Predicting the next storm surge flood.**

Stamey, Barry, Wang, Harry and Koterba, Michael. Sea Technology, Volume 48 Issue 8 (August 2007) Pages 10-13,15.

√IPENZ 18/49 **Multi-criteria decision support systems for flood hazard mitigation and emergency response in urban watersheds.**

Levy, Jason K, Hartmann, Jens, Li, Kevin W, An, Yunbi and Asgary, Ali. Journal of the American Water Resources Association, Volume 43 Issue 2 (April 2007) Pages 346-358.

√IPENZ 18/50 **Testing corrosion rates on steel piping in geothermal district heating.**

Ince, Umut, Toksoy, Macit and Guden, Mustafa. Materials Performance, Volume 47 Issue 5 (May 2008) Pages 56-59

√IPENZ 18/51 **The principal-agent problem and transport energy use: Case study of company lease cars in the Netherlands**

Graus, W and Worre, E. Energy Policy, Volume 36, Issue 10 (October 2008) Pages 3745-3753.

√IPENZ 18/52 **Regulation of microgeneration and microgrids.**

Costa, P., Matos, M and Lopes, J.

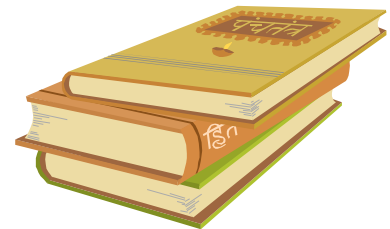
Energy Policy, Volume 36, Issue 10,(October 2008,)Pages 3893-3904.

√IPENZ 18/53 **Assessing the energy vulnerability: Case of industrialised countries.**

Gnansounou, E. Energy Policy, Volume 36, Issue 10 (October 2008) Pages 3734-3744.

## Books held in Energy Library

These can be borrowed directly by Energy Library members or via interlibrary loan by non-members.



√IPENZ 18/54 **In pursuit of the perfect plant: A business and technical guide** (2008). Kennedy, Pat and others. New York: Evolved Technologist Press

This very useful text provides a unique and expansive view on the challenges and opportunities modern plants face in planning, asset management, energy management, visibility and quality management. A comprehensive road map is laid out to help manufacturers achieve the highest optimal performance from operating plants. The book includes insight and case histories from more than 100 manufacturing experts, including SAP, OSIsoft, Cisco and Tata Consultancy Service. This book will provide a better understanding of the connections between business processes and technology.

√IPENZ 18/55 **Performance consulting: A practical guide for HR and learning professionals.** 2008. Robinson, Dana Gaines; Robinson, James C. 2nd edition, revised and updated. San Francisco: Berrett-Koehler Publishers

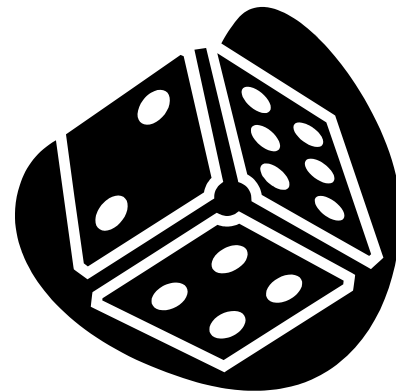
Performance consulting is a process in which a client and consultant partner can achieve business goals by optimizing their workgroup performance. In this updated edition the authors show readers how to work with management to identify the performance required to achieve business goals and assist management in taking actions needed for performance to change.

√IPENZ 18/56 **William H. Pickering: America's deep space pioneer.** (2007). Mudgway, Douglas J. Washington, DC: National Aeronautics and Space Administration.  
Sir William Pickering, rocket scientist, team leader and motivator and New Zealander was also Director of the company responsible for sending the first US satellites into space. He was a major contributor to space exploration during the early years of the Space Age.

√IPENZ 18/57 **Successful business planning: energizing your company's potential.** (2004) Paley, Norton. London: Thorogood, 2004  
Paley is a well known author and lecturer in marketing and management. He says that although we know the value of planning in theory we still fail to spend the time required to go through the thinking and planning process properly or we fail to use the business plan effectively. Case studies are used to illustrate the use of successful business strategies.

√IPENZ 18/58 **Safety, culture and risk: the organisational causes of disasters.** (2005) Hopkins, Andrew. Sydney: CCH Australia  
This book has been written by one of Australia's foremost thinkers on workplace safety and draws attention to failures by organisations, as distinct from failures by individuals as major causes of accidents. It will be of interest to readers who want to learn from investigations of major accidents as well as learning about the concepts of managing safety risk.

√IPENZ 18/59 **Alignment: Using the balanced scorecard to create corporate synergies.** (2006). Kaplan, Robert S.; Norton, David P. Boston: Harvard Business School



## Special focus topic : Risk Management

√IPENZ 18/60 **The new arsenal of risk management.**  
Buehler, K., Freeman, A. and Hulme, R. Harvard Business Review, Volume 86 Issue 9 (September 2008) Pages 92-100.  
The global banking system is facing a severe liquidity crisis: In the first half of 2008, major financial institutions wrote off nearly \$400 billion, causing banks around the world to initiate emergency measures. Similar crises have occurred within recent memory. Risk is, quite simply, a fact of corporate life—but because risk-management research has increasingly emphasized mathematical modeling, managers may find it incomprehensible and thus shy away from powerful tools and markets for creating value. The authors describe the evolution of risk management since the 1970s, show how new markets have changed the landscape in both financial services

√IPENZ 18/61 **Infrastructure Vulnerability Assessment Model (I-VAM).**  
Ezell, B., Risk Analysis: An International Journal, Volume 27 Issue 3, (June 2008) Pages 571-583  
Outlines a model to identify critical infrastructure at risk.

√**IPENZ 18/62 Risk analysis for critical asset protection.**

McGill, William, Ayyub, Bilal M, Kaminskiy, Mark · Risk Analysis: An International Journal; Vol. 27 Issue 5 (October 2007) Pages 1265-1281.

This article is concerned with making strategic asset-level resource allocation decisions for critical infrastructure. It proposes a quantitative risk assessment and management framework comprising five phases: scenario identification, consequence and criticality assessment, security vulnerability assessment, threat likelihood assessment, and benefit-cost analysis. This methodology begins with an asset-driven analysis which focuses on fundamental asset characteristics so as to produce a set of plausible threat scenarios. It also includes an innovative approach to threat likelihood assessment. Application of the proposed framework is demonstrated via a notional example and extensions of the model are suggested.

√**IPENZ 18/63 Going to the mat with spreadsheet risk.**

Cummings, J. Business Finance , Volume 14 Issue 9 (September 2008) Pages 32-35.

In this article information on the benefits of using software applications in spreadsheet risk management is provided. As well, the seven controls needed to protect spreadsheet baselines are highlighted accompanied by graphs drawing attention to spreadsheet quirks. Related to this, businesses which offer such packages have increased in number, as evidenced by the market overview of Gartner Inc in March 2008.

√**IPENZ 18/64 Engineering value into enterprise risk management.**

Ramamoorti, Sridhar, Watson, Marcia Weidenmier Internal Auditor, Volume 65 Issue 5 (October 2008) Pages 53-59.

By viewing enterprise risk management (ERM) utilising the perspective of the Six Sigma business strategy, this article shows how internal auditors can assist their organisation in improving its risk management and control systems. Both ERM and Six Sigma focus on delivering value to stakeholders as well as dealing directly with risk and uncertainty. Several Six Sigma implementation tools are discussed and a chart illustrating the parallel processes when simultaneously adopting ERM and Six Sigma is provided.

√**IPENZ 18/65 Emerging legal risks for construction management professionals**

Banik, Gouranga C, May, Andrea L Leadership & Management in Engineering Vol. 6 Issue 3 (July 2006) Pages 102-109.

Typically in the construction industry, an architect, general contractor and subcontractor collaborate on a construction project. Recently this tripartite system has changed with the addition of construction managers, which has significantly affected the risk allocation assumed by each party in a construction project. At the same time litigation due to conflicts and questions relating to the respective duties and responsibilities is increasing. Generally speaking, architects and engineers are avoiding liability by removing inspection and supervision responsibilities from their contracts, while the legal responsibilities of construction managers are growing. However the addition of construction managers has not been taken into account by the courts and so there are not many decisions which actually address the legal concerns raised by their participation. Interview responses from construction management firms relating to their perception of the risks and liabilities in construction management are analyzed and then the rise and fall of these identified risks are looked at. Relevant case law is reviewed so as to help construction managers and their legal counsel to find their way through this emerging field of construction law.

**IPENZ 18/66 Objectively assessing risk in a complex world**

Lyons, Jan Leadership & Management in Engineering Vol. 8 Issue 4 (October 2008) Pages 231-254. Risk management for engineers usually means events directly linked to specific programme elements, such as design criteria, commitments for the required programme resources or carrying out the programme plan to budget and schedule. Obviously these risks related to the engineering effort need to be addressed and managed in order to produce a successful programme outcome. At the same time, due to operating environments becoming more complex and interdependent, it is no longer possible to assume that events outside the programme plan will not happen or will only result in minor inconvenience. Ceiling panel collapses in the Boston Big Dig tunnel and levee breaches in New Orleans are two examples of recent catastrophic events associated with large public projects. Such events can not only impact on the successful implementation of the overall infrastructure program but can also negatively affect professional reputations and generate questions of institutional bias and complacency. These externally produced risks may occur because of mistakes by an intermediate supplier or a subcontractor's subcontractor or an oversight or inaction by a customer or government representative, and are easily overlooked during planning and execution in a complicated and multifarious environment.

## Special focus topics in previous IPENZ Engineering Updates

TOPIC	IPENZ Update Link
➤ Electric vehicles	➤ <a href="#">Aug 08</a>
➤ Environmental Management Systems	➤ <a href="#">July 08</a>
➤ Biofuels	➤ <a href="#">June 08</a>
➤ Peak oil	➤ <a href="#">May 08</a>
➤ Rail transportation	➤ <a href="#">April 08</a>
➤ Planning aspects of windfarms	➤ <a href="#">Mar 08</a>
➤ Water reuse/ graywater/greywater	➤ <a href="#">Feb 08</a>
➤ Disaster and emergency planning and management	➤ <a href="#">Jan 08</a>
➤ Financing infrastructure/Public private partnerships	➤ <a href="#">Nov/Dec 07</a>
➤ Sustainability	➤ <a href="#">Oct 07</a>
➤ Geothermal energy	➤ <a href="#">Sept 07</a>
➤ E-waste/Electronic Waste	➤ <a href="#">Aug 07</a>
➤ Floods	➤ <a href="#">July 07</a>
➤ Green building	➤ <a href="#">June 07</a>
➤ Fuel cells	➤ <a href="#">May 07</a>
➤ Airports	➤ <a href="#">April 07</a>
➤ Tidal and ocean power	➤ <a href="#">March 07</a>