Guest Editorial:
Special Issue on Asset Management and Maintenance Engineering

Introduction

The Association of Professional Engineers of Trinidad and Tobago (APETT) hosted its 17th Annual Technical Conference on the theme of "Asset Management and Maintenance Engineering", that was held at the Faculty of Engineering, The University of the West Indies, Trinidad on 11-12 March 2004. A total of 49 contributions were submitted to this Conference of which 36 were selected for presentation after a rigorous review process. This Special Issue of the JOURNAL of APETT contains a balanced set of some of the better papers presented at the Conference.

Asset management and maintenance engineering are sufficiently broad to include a wide range of topics. Assets represent a very significant cost through lost production and customer credibility when they are inoperable. Today's organisations need to recognise the role of asset management and maintenance engineering to optimise the use of lazy assets and profitability. The key is the management of the asset lifecycle, from acquisition through maintained life to disposal. The adoption of new and improved practices and systems such as reliability-centred maintenance, computerised maintenance systems, vulnerability analysis, quality assurance and hazard analysis can realise remarkable benefits (e.g. improved asset availability, life-cycle costs, inventory control, hazard control and continuous improvement).

Asset management and maintenance engineering can be broken down into two discrete, definable levels. The first is the strategic level, where high-level corporate objectives and business plans are inputs to the asset and maintenance management process. The second is the operational level where the actual methodology on the ground is managed, and it addresses how much maintenance, by whom, and at what cost. Broad corporate and company objectives feed business plans, which in turn feed actual operational plans and objectives. Both levels are influenced by other corporate functions, such as finance, human resources, and production.

About This Issue

This Special Issue includes eight contributions selected from the Conference and are grouped into two categories. The first four papers are in the area of asset management while the second four address maintenance practice and related issues. These papers encompass the work carried out by researchers and practitioners from a wide range of industries ranging from the oil refinery, power generation to manufacturing and financial services in Trinidad and Tobago as well as the Caribbean region. Both strategic and operational levels of asset management and maintenance engineering are addressed. The relevance and usefulness of each paper are summarised in the following.

K. Jhagroo's paper, "**Petrotrin's Initiatives towards Asset Integrity and Reliability Improvements in the Pointe-a-Pierre Refinery**", outlines an improvement project in the Refining and Marketing Division of the Petroleum Company of Trinidad and Tobago Limited, and comes up with the methodology used in the development of a Business Improvement Plan for its refinery at Pointe-a-Pierre. The methodology

presented provides practical references for the company to attain sustainability of the benefits from the project. The experience gained showed a practical case of improvement initiatives in the areas of asset integrity and reliability.

C. Sharma and S. Bahadoorsingh, in "**A MATLAB-Based Power Generator Maintenance Scheduler**", examine a new heuristic algorithm based on the tabu search to solve maintenance problems and presents a PC-based Windows application software package for production of optimised maintenance schedules. A software package, Automated Optimised Generator Outage Scheduler, was developed using The Power Generation Company of Trinidad and Tobago as the testing ground. The paper demonstrates the effectiveness of the approach and software using numerical results.

B. Ramlal, "**Using GIS for Asset Management in Trinidad and Tobago**", presents the potential application of Geographic Information Systems (GIS) in managing and maintaining national assets in Trinidad and Tobago with respect to the development of its countrywide infrastructure and new constructions. GIS is a nascent technology and could be used in conjunction with several other technologies to provide effective solutions. Discussions on strategies for GIS development and the limitations and benefits of using GIS in asset management are also addressed in the paper.

W.H.E. Suite in the paper, "**Vulnerability Analysis: A Critical Tool in Asset Management**", explains the importance of planned and systematic maintenance and discusses the adoption of vulnerability assessment in the feasibility study of physical assets with particular reference to the Caribbean region. The paper addresses how and why the vulnerability assessment would help safeguard the completeness of a feasibility study and enhance the effectiveness of maintenance and asset management practices.

A. Ramdeen and K.F. Pun in their paper, "**Development of a Computerised Maintenance Stores System in a Distiller Manufacturer: A Case Study**", present the development of a computerised maintenance stores system (CMSS) in a distiller manufacturer in Trinidad. It investigates the information requirements and store operations and describes the conceptual, logical and physical database designs of the CMSS for the Company. The evaluation of the system stresses its operational effectiveness by comparing the time requirements in manual versus computerised stores operations. The case study provides some practical references for other manufacturers and practitioners to develop their CMSS.

M. Nathai-Balkissoon and N.S. Arumugadasan, in "**Implementing Hazard Analysis Critical Control Points (HACCP) in a Food Plant**", present the implementation of the HACCP system for a food manufacturer of flaked, ready-to-eat breakfast cereals in Trinidad. The implementation has demonstrated good manufacturing practices in the areas of plant and equipment, operating procedures and policies and improved asset and maintenance management in the company. The paper underlines the importance of maintaining an effective HACCP system that would require continual review and revamping.

W. Mitchell and N.S. Arumugadasan, through "**Reliability Improvements in Network Maintenance at RBTT Financial Holdings Limited"**, report a project implementation on reliability improvements in maintaining the telecommunication network of a leading bank in Trinidad. The project has come up with several process benchmarks using total quality management and reliability-centred maintenance analysis, and the findings showed substantial improvements in the operations of the bank.

A. Gittens, *et al*. using "**An Integrated Design, Manufacturing and Maintenance Approach to Product Development: A Case Study**", present the application of an integrated approach to product development involving design, manufacturing, assembly, maintenance, and recycling. A case study on the development of a battery-operated passenger cart for airport terminals is used to illustrate the efficacy of the approach. Product features, strength and stability were analysed for compliance with the design specifications.

Conclusions

This Special Issue offers a platform for sharing experiences, presenting results, and reviewing recent developments of asset and maintenance management and related engineering disciplines in the Caribbean context. It intends to attract a wider interest amongst professional engineers, practitioners, managers and executives to explore opportunities for improvement and identify new directions in the areas of asset management and maintenance engineering that would enhance their organisational performance.

On behalf of the Editorial Committee, we take this opportunity to gratefully acknowledge colleagues and practising professionals from industry and other organisations who have made this publication possible with their research work and written contributions.

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