



SIMTech

for Industry

SPRING
singapore
Enabling Enterprise

Dear Friends from Industry,

PE COI has launched eight initiatives as part of our continuous effort to help the precision engineering companies in Singapore venture into high growth industries. On 20 May 2011, our PE COI Annual Conference received very good response from the industry and government agencies. The event provided a good platform for local companies to explore business opportunities with the MNCs in some of the fast growing industry sectors. A series of events are planned after the PE COI Annual Conference. We look forward to your company participating in some of these upcoming meetings and events. Some of the events are listed in this newsletter and on our website, www.pe-coi.sg

Dr John Yong
Director, PE COI

Meet-the-Consultants Sessions (0900 – 1200 hrs)

- 15 Jul 2011
- 15 Sep 2011
- 15 Nov 2011
- 15 Aug 2011
- 17 Oct 2011

Upcoming

SIMTech Annual Manufacturing Forum (AMF'11)

AMF'11 comprises an Annual Manufacturing Lecture (AML), a panel discussion, technical sessions and an exhibition. The highlight is the AML where prominent industry leaders are invited to speak and provide critical technological insights and directions for captains of the manufacturing and related industry. AMF'11 is the 6th consecutive SIMTech Annual Forum.

We will send you the invitation and confirmed programme in due course. Look out for it!

In this Issue:

1 - 3

Upcoming

- AMF'11
- Industry Initiatives

4

PE Expert Consultant Profiles

- Dr Lin Wen-Jong
- Dr Andrew Soutar

5 - 7

Past Events

- PE COI Annual Conference
- MPO Seminar (Oil & Gas)

8

Feature

- Revamp of PE COI website

9

Equipment News

- Wet Process Benches
- High Speed Camera

10 - 11

PE Consultants Highlight

12

Course

- WDA course

Industry Initiatives

PE COI rolled out these initiatives for the precision engineering industry to venture into high growth industries. The initiatives are:

- Oil & Gas
- MedTech
- Equipment Design & Simulation
- Aerospace
- Operations Innovation
- Heat Treatment
- Complex Equipment
- Surface Finishing



Oil & Gas Initiative

This initiative aims to develop indigenous deep-hole gun drilling, boring, trepanning and Fibre-laser cladding capabilities on exotic materials to attract a new range of high performance and corrosion resistant oilfield equipment to Singapore. An Oil & Gas team will promote, develop and transfer know-how and capabilities relating to laser cladding of Inconel 625; gun drilling, boring and trepanning of Inconel 718; drill heads designs through a series of workshops, seminars, consultancies, collaborative industry projects and consortia.

Contact: Dr Lim Beng Siong

Tel: 6973 8370 | Email: bslim@SIMTech.a-star.edu.sg



Engineering Design and Simulation Initiative

The Engineering Design and Simulation Initiative is a cross-functional initiative set up to exploit the use of simulation to enhance design in various engineering fields so as to improve productivity across design, engineering and manufacturing activities.

Contact: Dr Lin Wen-Jong

Tel: 6973 8988 | Email: wjlin@SIMTech.a-star.edu.sg



MedTech Initiative

The MedTech Initiative intends to help local companies venture into the MedTech industry through a mix of value chain, technology and capability development consortia. Manufacturing consortia-based projects will be implemented to enhance the technical capabilities of the medtech companies. Workshops and seminars will be organised to promote and impart the advanced technologies. The initiative will also address the needs and challenges faced by the Singapore industry as it diversifies and migrates to medtech products manufacturing.

Contact: Mr Robert Lee

Tel: 6793 8436 | Email: cmlee@SIMTech.a-star.edu.sg



Aerospace Initiative

Based on industry needs, an industry collaborative model involves a queen bee approach with an MNC and the local supply chain in Singapore creates niche capabilities in engine safety and component life span. These areas are of value to the aerospace industry. Critical to this is process reproducibility and part quality consistency. The objective of the industry collaboration is to develop automated surface finishing and to transfer this to an existing company or to deploy it in a joint venture or spin-off. In this manner, a unique technological competitive edge and jobs will be created for Singapore.

Contact: Dr Khong Heng Poh

Tel: 6793 8479 | Email: hpkhong@SIMTech.a-star.edu.sg



Operations Innovation Initiative

The objectives are to upgrade the local SME's capability and productivity in High Value Manufacturing through the Operations Innovation Programmes including: High-Mix Low-Volume (HMLV) consortium for Integrated Production Planning and Shopfloor Tracking; Lean Manufacturing Initiative for Leadtime and Productivity Improvement; Manufacturing Operations Management Graduate Diploma Course for Workforce Skills Upgrading; Productivity Development Programme for Companies and Trainers; Cellular Manufacturing System Development for HMLV Production.

Contact: Ms Laura Xu

Tel: 6793 8395 | Email: xxxu@SIMTech.a-star.edu.sg



Heat Treatment Initiative

This initiative develops the process routes and transfers technology to improve the competitiveness of the local heat treatment companies. This is achieved through Company upgrading and investment analysis; and Gas quenching, stepped quenching and advanced heat treatment targeting low pressure carburising and case depth control. The goal of the Heat Treatment Initiative is to develop the core capabilities through consortium activities and direct industry projects.

Contact: Mr Tan Boon Hee

Tel: 6793 8524 | Email: bhtan@SIMTech.a-star.edu.sg



Complex Equipment Initiative

The objective of the complex equipment initiative is to help enhance the business competitiveness and opportunities of the local SMEs in the manufacture of high value complex components, complex electromechanical modules and complex equipment through technological capability development. The initiative meets this objective through collaborative industry projects and technological capability upgrading programmes through the precision engineering industry value chain.

Contact: Ms Wan Siew Ping

Tel: 6793 8298 | Mobile: 9624 6282

Email: spwan@SIMTech.a-star.edu.sg



Surface Finishing Initiative

The Surface Finishing Initiative aims to launch various collaborative industry projects over the 3 years. These are the application of fluoropolymer coatings for friction control on bearing surfaces for oil and gas tooling and equipment; biocompatible coatings for medtech devices; and metals recovery and waste water treatment using novel electrochemical processing techniques.

Contact: Mr Peter Collier

Tel: 6973 8531 | Email: peterc@SIMTech.a-star.edu.sg

PE Expert Consultant Profiles

Biography of Dr Lin Wen-Jong

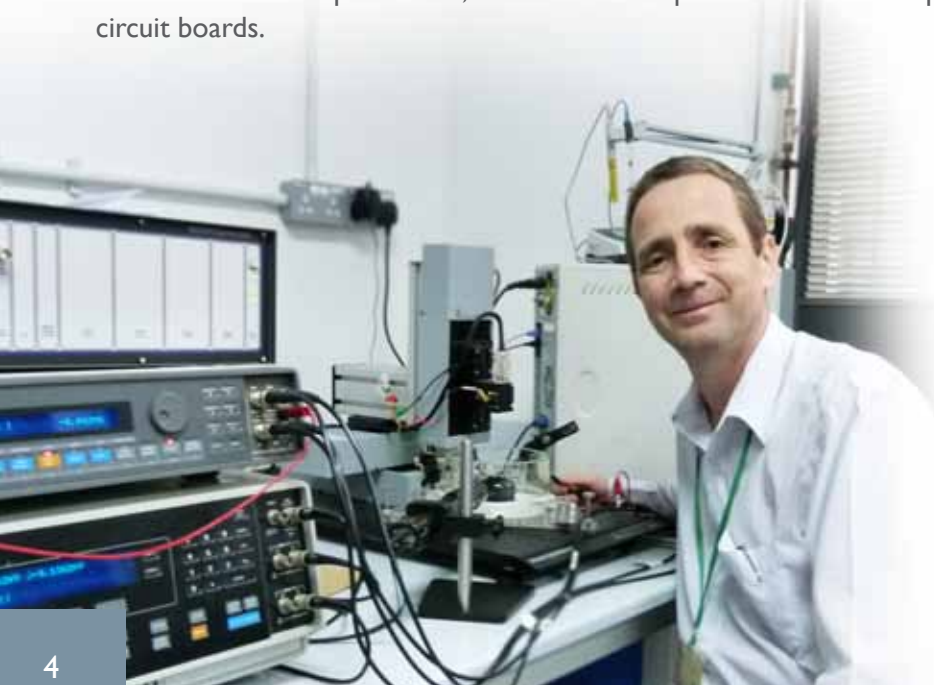
Dr Lin Wen-Jong received the MSc (Eng) degree in Advanced Manufacturing Systems and Technology from Liverpool University, UK in 1991, PhD degree in Manufacturing Technology at Imperial College, University of London, UK in 1997, Postgraduate Diploma in Structure Engineering and Foundation at University of Westminster, UK in 1999 and MBA degree from Nanyang Technological University, Singapore in 2003. Dr Lin is also a member of Institute of Mechanical Engineering (IMEch), UK and a Chartered Engineer (CEng) of Engineering Council UK.

He has more than fifteen years of industry experience with SMEs and MNCs such as IBM (Taiwan and Singapore), GE (Singapore), Schlumberger (Singapore) etc. He also serves as an Adjunct Assistant Professor with the National University of Singapore. He specialises in mechanical design, FEM, Neural Network, Fuzzy Logic motion control, real-time control and robotics with physical background and experience in mechanical/software control engineering, and a wide range of automation projects in the food, medical equipment, aerospace overhaul, and precision machine industries.



Biography of Dr Andrew Soutar

Dr Andrew Soutar was a Research Scientist for the Cookson Group in the UK for six years prior to moving to Singapore. At Cookson Technology Centre, he focused on the development of conducting polymer films and moved on to solder paste and coating materials used in the manufacture and assembly of printed circuit boards. After four years he transferred to Alpha Metals, where he developed a silver finish to preserve the solderability of copper on printed circuit boards.



He joined SIMTech in 1996 where he developed no-clean assembly materials and processes. He was also involved in the development and qualification of ceramic flip chip packages for an industrial partner. He is now a Senior Scientist. For the last ten years, he has worked on projects covering a range of coatings for applications in the electronics, construction, alternative energy and aerospace industries. His major interests are in sol-gel coatings and corrosion prevention.

Past Events

PE COI Annual Conference on 20 May 2011

The PE COI Annual Conference was held at SIMTech on 20 May 2011. There were 167 attendees including 134 from 76 companies and 33 from government agencies and institutes of higher learning. The conference provided an invaluable opportunity for SMEs in Singapore to explore business partnerships with leading manufacturers in the oil and gas, aerospace, medtech and complex equipment sectors - particularly with the rapid localisation of the manufacturing activities in this high growth region.

Local companies have gained a deeper insight on the trends, gaps and strategies involved so that industry-wide collaborative projects can be cost-effectively formed with the support from A*STAR, SIMTech, SPRING Singapore, EDB, IE Singapore, JTC Corporation, WDA and PE COI. At the conference, MNCs such as Johnson & Johnson and Acme Monaco (MedTech), Rolls-Royce (Aerospace), Managed Pressure Operation (Oil & Gas), Caterpillar Asia (Mining vehicle and equipment) shared some of their localisation requirements and supply chain development programme.

>> Continued on pg 6





▲ Signatories of the SBF and SIMTech MOU
 From left to right: Mr Victor Tay, Chief Operating Officer, SBF and Dr Lim Ser Yong, Executive Director, SIMTech



▲ Lively discussion with the Panel Members



▲ Keen interest from attendees on the exhibits

>> Continued from pg 5

Leads of the eight PE COI initiatives also shared some of the key capabilities required to enable local companies to confidently undertake higher precision and higher value manufacturing activities to meet stringent performance requirements. After the conference, specific company-led “by-invitation roundtable” discussions will be arranged and technological capability development consortia formed to retain Singapore’s position in these key areas.

At the conference, the Singapore Business Federation and SIMTech also signed a memorandum of understanding to assist local manufacturing and services companies develop R&D capabilities and foster stronger research collaboration.

Supplier Development and Localisation Seminar - Hard Facing, Cladding, Elastomer Moulding, 5-Axis Waterjet Cutting and On-site Exotic Material Machining (14 Feb 2011)

This Oil & Gas-based Supplier Development and Localisation Seminar attracted 76 local participants from 35 companies. Mr Alex MacGregor, Development Manager of Managed Pressure Operations (MPO) provided an overview of the



challenges involved, particularly with pressure built-up in deep sub-sea wells and floating platform. Alex further gave the potential suppliers a perspective of the support required from our local companies. These include the provision of cladding, hard-facing, elastomeric seal moulding and 5-axis waterjet machining services. In addition, MPO is seeking to collaborate with companies to jointly develop on-site inspection, cladding and

◀ Mr Alex MacGregor, Development Manager, MPO

machining services for extremely long barrels which cannot be logistically transported to Singapore.

Four speakers from SIMTech shared the institute's expertise, experience and case studies. Dr Lim Beng Siong provided an overview of the challenges involved with the hard-facing, cladding and spraying of exotic material to cater for extreme temperature, pressure and highly corrosive wells. The successful industrial development, characterisation and implementation of high velocity oxy-fuel techniques for cermet and polymeric deposition to prolong the useful life of oil tools were given by Mr Tan Boon Hee. Dr Bi Guijun shared some of the case studies from the marine, energy and Oil & Gas sector together with the productivity and quality gained by industry using SIMTech Fibre Laser technique for the cladding of Nickel and Titanium-based alloys. Mr Pan Dayou presented a detailed integrity, quality and productivity comparison between laser cladding and arc welding of Inconel 625.

Arising from this PE COI's industry development initiative, MPO is able to rapidly connect, develop and nurture its key suppliers in Singapore. This will further help to sustain the commercial viability of local companies involved with on-site machining, cladding, hard-facing, elastomeric seals and water-jet cutting in the Oil & Gas sector.

Contact us for your potential roles and contributions in growing these promising sectors:

Dr Lim Beng Siong

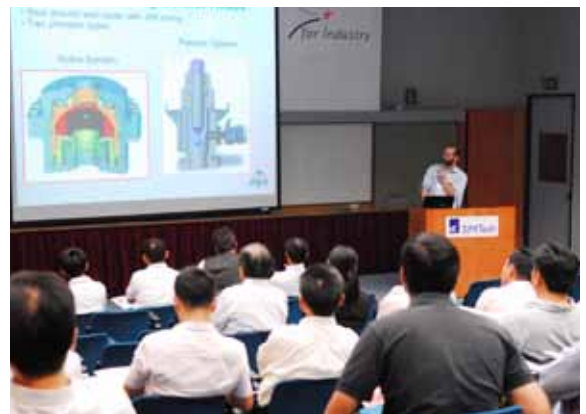
Senior Scientist, PE COI Oil and Gas Initiative Lead, SIMTech

Email: bslim@SIMTech.a-star.edu.sg

Mobile: 9664 3967



▲ Key representative of local SME involved with Oil & Gas



▲ Seminar generated strong industry interest



▲ Mr Alex MacGregor in discussion with some members



Feature

Welcome to the revamped PE COI Website. Based on your feedback, we have upgraded our website to cater to the needs of the industries. Explore new technologies and industry possibilities with PE COI by visiting our new website now!

Website URL:
www.pe-coi.sg

The screenshot shows the PE COI website homepage. At the top, the logo for Precision Engineering Centre of Innovation (PE COI) is displayed alongside SIMTech and 'for Industry' logos. A navigation menu includes Home, About Us, Our Services, Initiatives, Our Capabilities, Events, Tech Showcase, Downloads, and Contact Us. The main content area features an 'Upcoming Events!' section with dates and links for sessions like 'Monthly Meet-the-Consultants Session' and 'Hands-on RFID Workshop'. A central text block describes the PE COI's mission to create a conducive environment for SMEs. Below this, there are four main sections: 'Initiatives' (listing Oil & Gas, Aerospace, MedTech), 'Industry Collaboration' (a space to share technology knowledge), 'Consultants' (a grid of professional portraits), and 'Equipment' (showing a large industrial machine). At the bottom, there are sections for 'Supported By' (listing SPRING singapore and Agency for Science, Technology and Research) and 'Partners' (listing EDB singapore, ie Singapore, SPETA, WDA, and SIAA). A 'Downloads' section provides links for the PE COI Newsletter, PE COI Brochure, and Equipment Brochure. Five blue callout boxes are overlaid on the page, each pointing to a specific feature and providing a brief description.

Industry Initiatives

This section lists eight industry initiatives set up by PE COI.

Industry Collaboration

This is a space to share technology knowledge and practices. Look out for any suitable consortium to drive new growth for your business.

PE Expert Consultants

Browse through our PE consultants listing to identify suitable PE expertise and start to engage them on technical advice for your manufacturing problems now.

Our Equipment & Facilities

In PE COI, we host a wide range of the latest equipment and facilities to help companies build their technical infrastructure and capabilities.

Equipment News

Here are some of the recent available equipment for R&D and facility sharing:

Wet Process Benches

The wet process benches have facilities to conduct electroplating, electroless plating, anodising and other metal finishing/ surface treatment processes. Its specifications include:

- Mechanical agitation(back/ forth) with adjustable speed including a movable rotation cathode jig mounted on a manually operated hoist track
- DC rectifier /pulse DC rectifier
- Rinsing tanks
- DI water spray gun, DI water top up outlet, nitrogen (N₂) blow gun
- Chiller for anodising



The typical applications are Nickel plating, copper plating, solder plating and gold plating; Electroless plating; Aluminium and magnesium anodising; Other metal finishing and surface preparation.



High Speed Camera

This high speed camera provides an effective means to study ultra-high-speed phenomena or to troubleshoot costly industrial problem by allowing users to have a good instantaneous look into physical phenomena happening in engineering processes and systems. Its specifications include:

- 7,500fps at full pixel (1024 x 1024)
- Max. 1,000,000fps at reduced resolution
- 512 x 512 @ 25,000 fps
- 256 x 256 @ 87,500 fps
- 128 x 128 @ 262,500 fps
- Minimum Shutter: 369ns
- Memory: 32GB



The typical applications include R&D centres, dynamic physics, drop test, impact test, hard disk movement, automotive safety research, movie production, bio-engineering, etc.

PE Consultants Highlight

Metal Forming & Casting



Dr Atsushi Danno

- Former Board Member and Director in TOYOTA CRL.
- High Precision Bulk-Metal Forming Technology

danno@SIMTech.a-star.edu.sg



Mr Liu Peiling

- CAD/CAM/CNC toolkit and simulation system developer of InventorMould, Virtual CNC Training Lab & QuickCNC

plliu@SIMTech.a-star.edu.sg



Dr Khong Heng Poh

- Former Head of Process Engineering & Technology, Rolls-Royce Fuel Cell Systems, Singapore
- Machine Tool
- Automation

hpkhong@SIMTech.a-star.edu.sg

Plastic, Metal & Ceramic Moulding



Dr Li Qingfa

- Powder Injection Moulding and Powder Metallurgy

qfli@SIMTech.a-star.edu.sg



Mr Chen Ge

- Plastic Injection Mould Design
- Mouldflow

gchen@SIMTech.a-star.edu.sg

Welding & Joining



Dr Sun Zheng

- Welding Processes and Welding Metallurgy

zsun@SIMTech.a-star.edu.sg



Dr Wei Jun

- Diffusion Bonding and Micro/Nanojoining

jwei@SIMTech.a-star.edu.sg



Dr Andrew Soutar

- Surface Finishing

soutar@SIMTech.a-star.edu.sg



Dr Sandor Nemeth

- High Temperature Resistant and Scratch Resistant Coatings

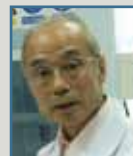
sandorn@SIMTech.a-star.edu.sg



Dr Ding Xing Zhao

- Tribological Hard Coatings

xzding@SIMTech.a-star.edu.sg



Mr Chang Jen Heng

- Former R&D Director and co-founder of Technochem
- Decorative Plating, Chemical Etching, Metal Stripping and Recovery

jhchang@SIMTech.a-star.edu.sg

Machining



Mr Kanno Shigeyuki

- Precision Machining Technology, Micro-Machining and Micro-ecm

kanno@SIMTech.a-star.edu.sg



Dr Lim Gnian Cher

- Laser Machining and Processing

gclim@SIMTech.a-star.edu.sg

Operational & Supply Chain Management



Dr Lim Yan Guan, Roland

- Lean Manufacturing, ERP system and Supply Chain Management

yglim@SIMTech.a-star.edu.sg



Dr Zhang Nengsheng, Allan

- Information Technology in Manufacturing Operations Management

nzhang@SIMTech.a-star.edu.sg

**Mr Chua Tay Jin**

- Production Planning and Scheduling
- tjchua@SIMTech.a-star.edu.sg

Manufacturing Execution & Control**Dr Goh Kiah Mok**

- Manufacturing System Design
 - Embedded System, Equipment and Device Interface
- gkmgoh@SIMTech.a-star.edu.sg

**Mr Wong Ming Mao**

- System & Supervisory Control
 - Automated Warehouse Control System
- mmwong@SIMTech.a-star.edu.sg

Green Manufacturing**Dr Song Bin**

- Green Manufacturing
 - Re-manufacturing
- bsong@SIMTech.a-star.edu.sg

MedTech**Mr Kiyoshi Chikashige**

- Medical devices
 - Design
- chikashige@SIMTech.a-star.edu.sg

Equipment Development**Ms Wan Siew Ping**

- Equipment and System Conceptualisation
 - Automation and System Integration
 - Modular Design and Documentation
- spwan@SIMTech.a-star.edu.sg

Process & Tool Condition Monitoring**Dr Lim Beng Siong**

- High Integrity and Performance Monitoring
 - Electrode, Tools and Work Piece Tracking
- bslim@SIMTech.a-star.edu.sg

Factory Automation**Dr Lin Wei**

- Precision Mechanism and Machine Design
 - Manufacturing Automation
- wlin@SIMTech.a-star.edu.sg

**Dr Lin Wen-Jong**

- CAE for Precision Machines
 - Vibration Analysis and Control
- wjlin@SIMTech.a-star.edu.sg

Reliability**Assoc Prof Tan Cher Ming**

- Electronic & Electrical Reliability
 - Failure Analysis
 - Quality Engineering
- ECMTAN@ntu.edu.sg

Precision Measurements**Dr Fang Zhongping**

- Optics
 - Metrology
- zpfang@SIMTech.a-star.edu.sg

**Dr Xu Jian**

- Image Processing
 - Vision Inspection
- jxu@SIMTech.a-star.edu.sg

Material Characterisation**Ms Liu Yuchan**

- Dimension Metrology
- yliu@SIMTech.a-star.edu.sg

Course

The Precision Engineering Workforce Skills Qualifications (PE WSQ) Specialist Diploma in Precision Engineering

The following seven courses are joint initiatives by SIMTech, A*STAR, and WDA, each consisting of five to six modules.

Graduate Diploma in Manufacturing Operations Management (MOM):

1 Aug 2011

Graduate Diploma in Precision Measurement Characterisation (PMC):

Sep 2011

Graduate Diploma in Sustainable Manufacturing: Jul 2011

Graduate Diploma in Mechatronics: Ongoing - starting next Module

Graduate Diploma in MedTech: Ongoing - starting next Module

Specialist Diploma in Precision Engineering: Jul 2011

Contact person: **Ms Connie Ng**

Tel: 6793 8986

Email: yyng@SIMTech.a-star.edu.sg



About the Precision Engineering Centre of Innovation (PE COI)

The PE COI serves as a national resource and aims to proactively assist the upgrading of SMEs within the PE sector. It provides technology and IT related services and know-how to industry through the following means:

- Consultative role: companies requiring short term advice in resolving imminent technical and productivity improvements issues can effectively use the PE COI to serve as their in-house consultants.
- Technology development: companies needing help in the development of new technology that require more than consultative advice will be channelled to the appropriate institutions such as the research institutes within A*STAR and other institutions of higher learning. The PE COI will act as a one-stop centre to facilitate faster response to industry's needs.
- The laboratory facilities at the PE COI will be made available to the consultants and companies as well as researchers from institutions.

For enquiries, please contact: PE COI Technical Hotline

Ms Verlin at 6793 8360

Email: pecoi@SIMTech.a-star.edu.sg

Website: www.pe-coi.sg

Partners



Supported by:

