



**The Society of Chemical Engineers New Zealand Incorporated**  
**Newsletter No 123, June 2006**

***Notes from the Chair***

Chemeca 2006 in Auckland in September is fast approaching and the indications are that we should have a very good representation of the profession from across the Tasman, so I hope all chemical engineers in this country who can do so, will make an effort to attend. See elsewhere in this newsletter for the latest report on this event. The assessment of a record number of nominations for the Awards of Excellence in chemical engineering (Rio Tinto, Exxon-Mobil, Alstom, Fluor, Shedd-Uhde and this year for the first time Fonterra and Worley Parsons) which are to be presented at Chemeca, was completed last week. We all look forward to these presentations.

This newsletter will be the final for some time emanating from Christchurch as the new management committee (Board) moves to the Waikato after this AGM. The executive secretary/treasurer, Tony Harcourt will continue to be based here and I will continue as corresponding member for Canterbury but most members of the existing committee are retiring. I would like to pay tribute to them all; Becky McDonald (minute secretary), Lindsay Halliday (newsletter editor), Reece Nicoll, Maria Wake and Chris Williamson. They have all rendered sterling service to the Society over the last three years and have been a delight to work with as well. I think it is probably timely that we reviewed the ranks of our corresponding members on the management committee and would invite anyone in a centre outside Hamilton, who is interested in contributing to the Society, to contact the new committee. The current slate of nominations for the new Waikato-resident committee to be elected at the AGM are: Simon Lovatt from AgResearch Ltd, Tristan Hunter from Fonterra, David Platts from Platts Drievap Engineering Ltd and James Carson, Johan Verbeek and Janis Swan all from the University of Waikato. Simon has agreed to take on the chair.

The two major projects we took on with the move to Canterbury have progressed well. The "Capital Cost Estimation for Process Equipment in New Zealand" was completed by June last year with the publication of the new book (both in hardcopy and electronic form). The second project, "Promotion of Chemical Engineering" is still a work in progress and is something the new committee will have to come to grips with. From the very large increase in numbers of students at both Auckland and Canterbury you might think it has been wildly successful even before it got off the ground!

Greg Ellis, SCENZ web-page editor, is currently up-dating the web-site and will continue in this role for the foreseeable future. Greg or your executive secretary are keen to receive comment or criticism on the web site.

*Brian Earl*

## SCENZ Annual General Meeting – Reminder!

The 35th Annual General Meeting of the Society will be held on Tuesday 4 July 2006.

Venue: University of Canterbury Staff Club, Ilam Road, Christchurch  
(Opposite Students Association Car Park)

Times:	5.00pm	Drinks & Nibbles
	5.30pm	Annual General Meeting
	Approx 6.00pm	Guest Speaker: Graeme Robertson DistFIPENZ

Graeme was one of the three chemical engineers promoted to Distinguished Fellow in the recent IPENZ awards. Graeme will speak on: "*The fall and rise of Cawthron Institute.*"

In the 1920s, Nelson's Cawthron Institute was considered New Zealand's preeminent research establishment. Some 60 years later it had fallen upon hard times, facing closure. Paradoxically, a decade of fierce competition amongst science providers during the 90s saw Cawthron recover, to become once again, a thriving, successful contributor.

As former CEO, Graeme will describe this recovery, reflecting upon the management principles at work and what he has learned about the differences between engineers and scientists. His talk will be illustrated by examples taken from the marine farming industry and include comments on this sector's potential and likely contribution to New Zealand's future.

## CHEMECA 2006 Update

**Darrell A. Patterson and Brent R. Young**  
Department of Chemical and Materials Engineering, The University of Auckland.

CHEMECA 2006, the 37<sup>th</sup> annual Australasian Chemical Engineering conference, is being organised by SCENZ and the University of Auckland. The conference takes place at the Langham Hotel, in Auckland, from the 17<sup>th</sup> to 20<sup>th</sup> of September. This article summarises the latest developments in the lead-up to our society's flagship conference. Full information and updates can be found on the conference website: [www.chemeca2006.auckland.ac.nz](http://www.chemeca2006.auckland.ac.nz).

### Management

In March, Dr Brent Young was appointed the conference co-chair alongside Prof X. Dong Chen. This was to ensure we had a local New Zealand-based chair, since in April Dong took up a new appointment at Monash University in Australia.

### Registration

Registration is now open. Details can be found in the registration brochure that you should have received via email or post. Alternatively, full registration details are on the Chemeca2006 website <http://www.cce.auckland.ac.nz/conferences/index.cfm?P=8192>. Note that SCENZ members are eligible for the special members discounted rates and you save NZ\$100 if you register before August 2006.

More than 220 attendees are expected, so this is perfect opportunity for professional development and networking. If you are a New Zealand Engineering Graduate, it is also a chance to catch up with your old Department, its staff and other alumni.

### Sponsorship and Exhibition

Sponsorship is going very well - we are ahead of both budget and forecast. We also have a handful of exhibitors and we would like more. So, if you and/or your company are interested in exhibiting your products, equipment and/or services at the largest Australasian Chemical Engineering Conference, please contact Mark Taylor, Chair of Sponsorship and Exhibition ([Mark.Taylor@auckland.ac.nz](mailto:Mark.Taylor@auckland.ac.nz)). The Sponsorship and Exhibition Prospectus is available on the website.

## Programme

The response to the call for abstracts was greater than expected and we received 274 abstracts. These were reviewed and authors were asked for full papers. We have received 206 of these papers to date (many late however!) and we are still waiting on 46 late comers (the balance having withdrawn their papers). These papers were sent out in early June to the Review Chairs to organize reviews by the end of the month. At present, we are on-track for meeting the deadlines for completion of the conference programme, proceedings and handbook.

## Social

Since the projected attendance is higher than initially expected, the Tuesday (19<sup>th</sup> of September) Conference Banquet venue has been changed to the Floating Pavilion in the Viaduct Harbour. This is Auckland's only floating venue (it gently rocks with the waves) and it offers magnificent views of both Waitamata Harbour and Auckland's skyline. For the fact finders out there - the venue was once the Oracle base during the last America's cup.

Two further social events are planned. The Welcome Reception is on Sunday the 17<sup>th</sup> of September, where you can meet other delegates and catch up with old friends while enjoying cocktails and canapés. A Poster Function is on Monday 18<sup>th</sup> of September, where you can mingle with delegates amongst poster presentations while enjoying drinks and canapés. Costs of all functions are included in the registration fees.

Overall, the conference is proceeding to plan and we hope to see you on September 17 to 20 in Auckland.

For any further information, please do not hesitate to contact the CHEMECA 2006 technical secretary, Dr Darrell Patterson ([darrell.patterson@auckland.ac.nz](mailto:darrell.patterson@auckland.ac.nz)).

## News from the Department of Chemical and Process Engineering, University of Canterbury

CAPE has had a busy number of months in the areas of teaching and research with important developments for both staff and students.

### Staff update:

- A number of academics have indicated full or partial retirements over the next 6 to 8 months including Ian Gilmour, John Abrahamson and Ken Marsh. Therefore CAPE is actively seeking to fill two academic positions. The research areas and level of appointment are flexible, more information can be found at our web site <http://www.cape.canterbury.ac.nz/>.
- Pat Jordan will be on sabbatical at the University of Sheffield for 12 months starting in July working on modelling and experimental aspects of micro-distillation. Khim Chu will be returning in August from a 12 month sabbatical.

### Students update:

- Our student enrolments remain strong this year with the 1<sup>st</sup> Pro class exceeding 50 for the second year in a row and intermediate enrolments remaining strong. I think this can be partially attributed to all members of SCENZ doing their parts in promoting chemical engineering as a degree choice.
- Our postgraduate enrolments remain strong and overseas enquiries are growing with the government's positive change in the funding policy for international Ph.D. students.
- An important review of the undergraduate curriculum was recently completed. One important change was to the final year research project to allow more flexibility for students to do different types of projects both within the department and at outside organisations including outside New Zealand.

### New research developments include:

- Canterbury has installed the most powerful supercomputer in Australasia, (supplied by IBM). This will greatly enhance computation fluid dynamics research being pursued by the teams led by Pat Jordan and John Abrahamson.

- Ken Marsh obtained a research grant from Schlumberger Technology looking at thermodynamic properties of solvents in heavy hydrocarbons.
- Conan Fee's NERF project looking at controlled drug delivery for ruminant animals has been extended for another year.
- Peter Gostomski has received funding from the BioPolymer Network to continue his work in microbial cellulose.
- Ken Morison is working in conjunction with a number of Southland organisations to develop modern monitoring tools to increase on-farm milk handling productivity.
- Chris Williamson is working with Carter Holt Harvey for process control improvements to their pulping facility.
- Shusheng Pang has received funding from New Zealand Green Fuel to look at plastics recycling using pyrolysis.
- Pat Jordan has received funding from Flo-Dry to model a pilot-scale sludge drying unit.

*Dr Peter Gostomski, Head of Department*

## **Joint Technical Meeting - 21 June, Rotorua**

The annual APPITA / IPENZ Waikato/BoP Branch / SCENZ joint meeting was held at the Kingsgate Hotel in Rotorua on 21 June. Following drinks, dinner and networking among the 40 or so attendees, meeting organiser Michael Walmsley of the University of Waikato introduced the three presentations.

In the first presentation, Richard Pearce (Genesis Energy), the project manager for the new "e3p" gas turbine at Huntly described the history of the project and its major challenges. He told us that "e3p" or Huntly Unit 5 includes hardware from Mitsubishi Corporation and Downer Engineering is the main contractor, but major components came from around the Asia/Pacific region. The gas turbine will deliver ~250MW and a heat recovery steam generator drives a steam turbine of ~135MW on the same shaft. This will add to the 1000 MW capacity of the main Huntly plant and another smaller aero-derived gas turbine that has been installed since 2004. Richard expected that the unit should achieve some 56-57% efficiency, which would be a great improvement on most existing thermal plant.

In the second presentation, James Neale of the Energy Research Group at the University of Waikato discussed ways to maximise energy savings in industrial compressed air systems. He noted that while energy costs can be optimised to make significant savings, those savings can be several orders of magnitude less than the potential costs due to system failure. Thus, most compressed air systems are over-designed to avoid such losses, resulting in energy efficiency compromises. James advocated an approach that starts on the demand side rather than the supply side, using leak reduction, peak load reduction, de-bottlenecking and appropriate pipe sizing. He could then move to the supply side, because the reduced demand would reduce the need for compressors (hence maintenance and power costs) and the compressor sizing and run order can then be optimised. James gave examples where the approach he described had saved hundreds of thousands of dollars in several plants. Tying his presentation back to Richard's talk on new generation capacity, James also noted that the reduced energy demand of those compressed air systems had saved some \$2 million in electricity generation investment.

In the third presentation, PhD students Martin Atkins & Jonas Hoffmann-Vocke of the University of Waikato discussed the application of computational fluid dynamics modeling to industrial processes. Martin introduced the topic by outlining the principles of CFD and by showing examples of a 3-D model of an oil jet cooling a piston and an air curtain on a soft drink chiller. Jonas then outlined the methods used to solve a real problem using CFD, starting with defining and simplifying the problem, then meshing to divide the problem into small discrete elements, defining the boundary conditions and model parameters, computing to solve the fluid flow equations, post-processing to generate pictures and animations, then verification and validation. Jonas showed a detailed example of flow design for an industrial air heater and Martin showed how he had used CFD to examine the flow in a wood pulp pressure screen. They noted that CFD software and hardware is now much less expensive than it used to be, but they advised working with experienced CFD users to get the best out of the modeling approach, rather than individual firms buying CFD software and hardware and making the major human resource investment that would be required to utilise the software and hardware most effectively.

Thanks to Michael Walmsley and Richard Hunt (IPENZ Waikato/BoP branch) for organising a very successful evening. While some SCENZ members attended this year, we hope that SCENZ members will contribute presentations to this meeting next year.

*Simon Lovatt*

## **News from UoA C&M Engineering for SCENZ Newsletter June 2006**

See separate accompanying notes, compiled by John Chen with assistance from others. (Separate PDF file for members who receive email copy of this newsletter)

## **What's Coming Up**

17<sup>th</sup> Annual Conference of the Australasian Association for Engineering Education

10<sup>th</sup>-13<sup>th</sup> December 2006, Auckland University of Technology

For programme details see [www.aut.ac.nz/schools/engineering/aaee\\_2006\\_conference/](http://www.aut.ac.nz/schools/engineering/aaee_2006_conference/)

### **Reminder – Overdue 2006 Subscriptions**

**As at 30 June, many SCENZ members\* have yet to pay their 2005/2006 subscriptions of \$30.00**

\* Not affected are IChemE members whose SCENZ subscription is automatically included in their IChemE subscription.

**Reminder notices will shortly be sent to those who may have overlooked payment.**

**Members should note that 2006/2007 subs will be due from 1 October and early payment of any outstanding dues would be appreciated.**



# The Society of Chemical Engineers New Zealand Incorporated

Affiliated to The Institution of Professional Engineers New Zealand & The Institution of Chemical Engineers United Kingdom

## APPLICATION FOR MEMBERSHIP

Membership is open to Professional Engineers, Scientists, and the others interested in Chemical Engineering

Title: (e.g. Dr, Mrs, Mr, Miss, Ms): \_\_\_\_\_ Family Name: \_\_\_\_\_

Initials: \_\_\_\_\_ Preferred Given Name: \_\_\_\_\_

Postal Address: \_\_\_\_\_

Business Address: \_\_\_\_\_

Telephone No. Business: \_\_\_\_\_ Private: \_\_\_\_\_

Fax No: \_\_\_\_\_ E-mail: \_\_\_\_\_

Academic Qualifications: (please include the awarding University/College and years): \_\_\_\_\_

Financial Member IPENZ: \_\_\_\_\_ No/Class of Membership: \_\_\_\_\_

Financial Member IChemE: \_\_\_\_\_ No/Class of Membership: \_\_\_\_\_

Membership of other Professional Bodies: (please indicate) \_\_\_\_\_

JOB DESCRIPTION: A brief description of your job and the nature of the organisation to which you belong

### DECLARATION

I believe myself to be a proper person to be elected a member of the Society Chemical Engineers New Zealand and do hereby promise that, in the event of my election, I will be governed by the Rules of the Society for the time being in force, or as they may be amended, and that I will promote the objects of the Society as far as may be in my power.

Signed: \_\_\_\_\_ Date \_\_\_\_\_

### How to Pay\*

Please invoice me     I enclose cheque for \$30     Receipt Required

Paying by Credit Card: (Visa & Mastercard Only)

Card No.           Expiry Date:

Paying by EFT: Please deposit funds into National Bank of New Zealand Account No: 060193 0244465 00 quoting your name as reference and fax/mail your application to the Executive Secretary.

\* Note that SCENZ membership is automatic and free to all financial members of IChemE.

Please send information on IChemE Membership Class:  Affiliate     Associate     Member     Fellow

### For Office Use

Received by SCENZ Secretary \_\_\_\_\_ Acknowledgement Sent: \_\_\_\_\_

Approval of SCENZ Board \_\_\_\_\_

Notification sent \_\_\_\_\_ Database \_\_\_\_\_ Email \_\_\_\_\_

IChemE Information Request: \_\_\_\_\_ IChemE Application \_\_\_\_\_

Please send to: The Executive Secretary, SCENZ, P.O. Box 28139, Beckenham, Christchurch 8242, New Zealand  
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