THE INSTITUTION OF ENGINEERS, SRI LANKA

NSW Australia Chapter

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ABN: 90 045 281 529

Annual General Meeting - 05 October 2014

Annual Report

1 IESL NSW Executive Committee

IESL NSW Chapter's fifth Executive Committee was elected at the Annual general Meeting (AGM) held on 29 September 2013. Since then committee held eleven committee meetings, numerous working party meetings and Skype meetings and worked on the strong foundation built by the four previous committees. This year's committee included the following:

- Mahinda Karunaratne (Chair)
- Waruna Kaluaarchchi (Vice Chair)
- Kamal Fernando (Past Chair until 20/08/2014)
- Dayan Gunasekara (Secretary)
- Ananda Herath (Treasurer)
- Sarath Weerasinghe (Editor until November 2013)
- Shamal Pannila (Editor from January 2014)
- Dushmantha Thalakotuna (Webmaster)
- Udeshini Pathirage
- Maha Mahadeva
- Dilupa Nakandala
- Buddhi Wijerathna

In addition, Roy Abeygoonawardana was appointed at the AGM as the Washington Accord Coordinator to provide assistance to IESL Accreditation Board for the Washington Accord application process.

With the help of the members, well wishers and the sponsors, the committee was able to deliver many outcomes as described below.

2 Memberships

The Chapter has identified various issues faced by our members in maintaining their membership by paying annual subscriptions on time. We are working with the Colombo office membership division to address some of these issues. Recently IESL Colombo office has appointed a Deputy Executive Secretary to coordinate membership issues with the NSW

Chapter. This appointment has enabled us to amicably resolve various outstanding membership issues. Since the inception of the online payment system, a number of engineers living in NSW and ACT have registered with the system. This is evident from a large number of positive comments received from our members. However, as requested by a few of our members, the NSW Chapter continues to facilitate membership payments via our Chapter.

IESL NSW Chapter has constantly raised the issue regarding the recognition of Australian degrees and Engineers Australia (EA) CPEng qualifications. According to the Executive Secretary of IESL Colombo office, the IESL has unilaterally taken a decision to recognise EA members' qualifications. This was announced in July this year.

- Candidates from Australia who have a full-time four year engineering degree course accredited by Washington Accord can apply for the Associate Membership of IESL. They will be required to submit copies of their Birth certificate, Engineering degree certificate and the academic transcripts certified by the Chairman or the Deputy Chairman of NSW Chapter along with a relevant Application fee.
- Candidates from Australia can apply directly for the IESL Corporate Membership, provided that they have membership of EA and CPEng, along with a four year full time Engineering Degree recognized by Washington Accord Signatory countries. They can submit scanned documents certified by the Chairman or the Deputy Chairman of NSW Chapter. They need to submit an experience report of no less than 2500 words. The interview panel for the PR will consist of two Corporate Members of IESL from NSW Chapter.

3 Knowledge sharing lectures and Industrial Visits

During the year the committee arranged the following four knowledge sharing lectures and one industrial visit facilitated by the committee member Dr. Dilupa Nakandala. All the lectures were held at the Engineers Australia auditorium at Chatswood.

- Eng. Nihal Fernando - Complex Communications and electronic Systems
- Dr. Jayantha Katupitiya –Autonomous Machines
- Mrs. Anusha Walisadeera - User Centred Ontology for Sri Lankan Farmers
- Mr. Adrian Bull - North West Rail Link – Technical Challenges and Current Status
- Visit to Sydney Water's St Marys Wastewater Treatment Plant

A summary of these lectures and the site visit can be found in Annexure 1 to this report.

4 IESL NSW Young Engineers day

This year's Young Engineers Day facilitated by the committee member Dr.Udeshini Pathirage was a great success. The following four presenters shared their research findings/experience at the Engineers Australia Auditorium.

- Eng Madhuka Jayawardhana(PhD candidate, University of Western Sydney) - "Decentralized Structural Health Monitoring using Wireless Sensor Networks"
- Eng Buddhi Wijerathna (PhD Candidate, University of Technology, Sydney) -"Advanced Condition Assessment and Failure Prediction Technologies for Optimal Management of Critical Water Pipes"
- Eng Deependra Puswella (Project Engineer, NSW Public Works)- "Wastewater Treatment Plants and success stories"
- Eng Muditha Pallewattha (PhD candidate of the University of Wollongong)- "Subgrade Soil Stabilisation along Rail Corridors through Native Vegetation"

A summary of these lectures can be found in Annexure 1 to this report.

5 IESL NSW Newsletters

The Editor Eng Sarath Weerasinghe (Editor until Nov 2013) issued first newsletter in November 2013. Then new Editor Eng Shamal Pannila issued 2 newsletters in March and July 2014. He also published the Souvenir Magazine for the Engineering Convention 2014. Udeshini Pathirage and Nalin Seneviratne made a significant contribution for editing throughout the year. The members and well wishers are encouraged to write articles to future newsletters. Please see Annexure 1 to this report for the Editor's brief.

6 IESL NSW Engineering Excellence Awards

This year, The Institution of Engineers Sri Lanka (NSW Chapter) presented Engineering Excellence Awards for the 3rd time in the following three categories:

- Best Paper published
- Best Innovation
- Best Infrastructure development project

The objectives of Engineering Excellence Awards are to recognise the commitment of the engineers of Sri Lankan background living in NSW for their service to the wellbeing of the community and the environment, and the innovation and excellence of the engineering solutions they deliver. The committee was delighted that this year it had received fifteen submissions of very high quality from various fields of expertise. The submissions were assessed by a panel based on the following criteria

- Scope of the nominee's involvement;
- Originality;
- Innovation;
- Value to the community;
- Solutions to an engineering challenge; and,
- Demonstration of excellence.

Based on the panel assessment the following six shortlisted submissions were presented at the Engineers Conference held on 30th of May 2014.
The winners were announced at the Gala Dinner on 31st of May 2014.

Best Paper published
Excellence Award:
A novel membrane distillation - Thermophilic bioreactor system: Biological stability and trace organic compound removal by Kaushalya Wijekoon
Highly commended Award:
Numerical modelling of geotextile reinforced embankments over deep cement mixed columns incorporating strain-softening behaviour of columns by Namal Yapage
Best Innovation
Excellence Award:
Hume Highway Upgrade, Woomargama Bypass Project by Priyadarshanie Weeraratne
Highly commended Award:
RoBuddy - Connect your world by Damith Herath
Best Infrastructure development project
Excellence Award:
The advanced condition assessment and pipe failure prediction project by Dammika Vitanage;
Highly commended Award:
Dunmore bridge structural capacity upgrade by Srimathi Ediriweera.

7 Our Sponsors

Due to the downturn in the industry, this year the Chapter faced a huge challenge in attracting sponsors. Despite this challenge we received sponsorships from following sponsors - both private sector and public sector. This is a recognition of IESL members' contribution to NSW. This year's sponsors were:

- Gold Sponsor – NSW Public Works
- Bronze Sponsors – Fulton Hogan, SMEC and JBS&G

8 IESL NSW Engineering Convention 2014

The IESL NSW Chapter concluded the annual Engineering Convention 2014 in grand style in the last weekend of May. The convention provided opportunities for networking, recognition of achievements of fellow engineering professionals through engineering excellence award scheme, and helped build the profile of the engineering profession. The Convention had two parts - Engineering Conference and IESL NSW Engineers' Gala Dinner.

8.1 Engineering Conference

The Engineering Conference was held on 30th May at the Engineers Australia Auditorium in Chatswood. The main highlight of the conference was the presentation of six selected submissions for Engineering Excellence Awards 2014. It was well-attended, informative and interesting session.

The President of IESL Eng Shavindranath Fernando in his Keynote Speech, highlighted the ongoing development projects in Sri Lanka and contributions that can be made by experienced engineers from countries such as Australia.

8.2 IESL NSW Engineers Gala Dinner

The Gala Dinner was held on 31st May at Castle Grande, Castle Hill. Attended by well over 300 engineers and their spouses and sponsored by NSW Public Works (Gold sponsor), Fulton Hogan, SMEC and JBS&G, it was a fun filled evening with thought provoking speeches from leaders in the engineering community. It also included entertainment by traditional Cook Islander Dancers and the presentation of Engineering Awards to six outstanding submissions. The keynote speech was delivered by the National President of Engineers Australia, Prof. Alex Baitch.

Read full report of the Convention in Annexure 2 to this report.

9 Working towards Washington Accord

In a major achievement, the IESL on Friday 13 June 2014 became a full signatory to the Washington Accord, paving the way for greater global mobility and employment avenues for Sri Lankan engineers. This was decided at a meeting of the International Engineering Alliance, the secretariat of the Washington Accord in Wellington, New Zealand.

This is a landmark decision for the Sri Lankan engineers who graduate with four year Engineering degrees accredited by the IESL. These engineering graduates will be internationally recognised in all other signatory countries as holders of engineering qualifications substantially equivalent to four year engineering programs accredited by the accrediting bodies of their own countries. They will be recognised as having met the academic requirements for entry to the practice of engineering in those countries as well. Currently engineering courses being conducted at the Universities of Moratuwa, Peradeniya and Ruhuna are accredited by the IESL.

The Washington accord model has become the international gold standard for mutual recognition of engineering education. For 25 years the Washington Accord has provided a mechanism for mutual recognition of engineering graduates of accredited programs leading to acceptance as Professional and Chartered Engineers among its signatories. The signatories to the Washington Accord as of 2013 are Australia, Canada, Chinese Taipei, Hong Kong, China, Ireland, Japan, Korea, Malaysia, New Zealand, Russia, Singapore, South Africa, Turkey, UK and USA. From June this year, our motherland Sri Lanka as well as India join this elite group.

The IESL had been trying to obtain the full membership of Washington Accord for a number of years without success. The IESL NSW Chapter with the support of Engineers Australia made a major contribution to achieve this major global recognition. I would like to thank late Eng. Kamal Fernando and Eng. Roy Abeygoonawardana of NSW Chapter for their valuable contribution and Engineers Australia for their guidance. I congratulate the President, and past and present Executive Committees of the IESL who have worked untiringly over the years to achieve this goal.

10 Assistance for newly migrant Engineers

In 2013, the Chapter initiated a Mentoring Program to assist recently migrated Engineers from Sri Lanka, in finding suitable employment in Australia. One of the main problems they are facing is the lack of knowledge of the Australian job application process.

The Chapter prepared a set of guidelines in this regard in order to provide a forum for newly migrated engineers to develop an on-going relationship by discussing matters relating to advancement of their professional career or continuation of their overseas career progression in Australia within an organised and supportive framework. This "Guidelines Booklet" is in draft form and is subject to improvements. Members are welcome to suggest improvements to the guidelines.

The Chapter maintains a database of Mentors in various disciplines so that a suitable Mentor could be selected to a Mentee when requested upon. So far, we have only a few. We need more from every discipline.

The first Mentor/Mentee agreement was signed on 30th May 2014. We have received two more requests from mentees indicating their interest in participation in the program. We are in the process of identifying suitable mentors.

11 Working with IESL headquarters

Since mid last year the Chapter is attending the first part of the monthly IESL Council meeting via video conferencing. The meeting is held first Friday of every month at 5pm Sri Lankan time. This year the Chair of NSW Chapter participated in eight meetings. This gives an opportunity for Chapter to raise any issues needing the attention of the Council.

In addition NSW Chapter Executive Committee members had several meetings with the IESL President, Council members and secretariat staff in person during the year.

12 Donations to IESL headquarters

The Chapter donated $5,100 worth of following equipment to the headquarters.

- iMac for video editing and multimedia activities
- HP LaserJet printer for SLEN and Certificate printing
- Three node NComputing system with screens for the library
- Apple final cut X pro for video editing

In December last year Chair, IESL NSW Chapter and Executive Committee Members officially handed over these equipment to the IESL President in Colombo.

13 Improvements to Chapter website

With the increase in social media presence through facebook and twitter, IESL NSW has been able to attract more members to interact with the Chapter website http://www.ieslnsw.org

In addition to existing features such as upcoming and past events, IESL NSW newsletters, SLEN, Advice to job seekers, Members' area, Multi media portal, Discussion forums, Recommended readings, useful links etc. the chapter is regularly publishing the photos of major events on social networks. Furthermore, you are also invited to submit your project information and photos to share knowledge with the wider engineering community.

The chapter website is now planned to undergo a hosting transfer to provide seamless availability. Eng. Nihal Fernando has offered web hosting with Cloud DIRECT free of charge to IESL Website and the Chapter would like to extend sincere gratitude to Eng. Fernando for this generous offer.

14 Participation at Techno 2014

Techno Sri Lanka - 2014, the National Engineering and Technology Exhibition will be held for its 29th consecutive year on 10, 11 and 12th October 2014 at the BMICH, Colombo Sri Lanka. Techno-2014 is the only exhibition held in Sri Lanka which features widest range of engineering and technology.

Since 2013, the Chapter is allocated a stall by IESL Colombo. Items presented in the stall generally include video clips, posters and leaflets on various projects undertaken in Australia especially on new technologies, health and safety aspects, innovation etc.

A similar arrangement has been organized for this year event too, which will be held on 10-12th October. Eng (Dr) Dayan Gunasekera and Eng. Shamal Pannila will participate in the event on behalf of the Chapter.

In addition to the exhibition, experts are also invited to do presentations. Dr Gunasekera will deliver presentations on "Water distribution pipe network modeling" at IESL Auditorium and Eng. Pannila on "Sydney Trains: The network and our focus" at TECHNO.

15 Financial Report

A separate audited financial report prepared by the Treasurer Eng. Ananda Herath forms a part of this Annual Report.

16 Tribute to Late Eng. Kamal Fernando

It is with pronounced sadness that we remember Late Eng Kamal Fernando on this occasion.
As a Past Chair of this organisation, Late Eng. Kamal Fernando was an instrumental figure. His tireless work and dedication has played a vital role in the progress of the IESL NSW Chapter to its present state.

His role in the organisation dates back to 2010 when he became a committee member. In 2011, he became Vice-Chair and the following year, the Chair of IESL-NSW. Throughout this period, Kamal's admirable work has won him great respect and friendships within our community. In particular, were his efforts in developing a strong relationship between IESL and Engineers Australia. This played a direct role in assisting IESL to achieve Washington Accord which will leave an important lasting legacy for young Sri Lankan engineers of the future.

Late Eng. Kamal Fernando will be remembered amongst our organisation as an extremely committed and selfless member who worked his utmost for the good of the organisation and others. Our members will reflect on Kamal as a good friend who left a positive impact on all our lives.

17 Suggestions for next year

The following is a summary of suggestions for next year. The successful delivery of these outcomes should further enhance the services of IESL in NSW to the profession.

- Encourage members to use IESL and IESLNSW websites
- Maintain and strengthen the link with Engineers Australia
- Assist IESL to sustain the full membership of Washington Accord
- Assist IESL to obtain mutual recognition with Engineers Australia
- Actively assist migrant engineers
- Continue to recognise excellence in achievements
- Engage with sponsors and industry partners
- Continue to create opportunities for knowledge sharing
- Set up sectional committees in different engineering disciplines such as Civil, Mechanical, Electrical etc to expand the Chapter to the next level

18 Conclusion

This year the IESL NSW Chapter completed five years in successful operation. During the past five years the Chapter has made significant achievements due to the untiring work, dedication and professionalism of our fellow engineers who volunteered to serve in past and present executive committees. I would like to thank all the fellow engineers of the past and present committees for their great commitment and dedication to bring the Chapter to its current status.

Engineers are crucial for helping to meet the economic and environmental challenges of the 21st century. Properly resourced and supported, professional engineers can design, build and maintain sustainable infrastructure for the future. However, it is sad to see that both in Australia and Sri Lanka there is no due recognition for the engineering profession and in many occasions professional engineering advice is ignored and developments are deviated from sustainable and optimum solutions. There is no established regulatory scheme for engineers similar to other professions. Therefore, the unity of the engineering community has now become more important than ever to address these vital issues. The professional bodies such as our institution are the best instruments for

engineers to unite and face these challenges. The IESL NSW Chapter has already started working closely with Engineers Australia to have a dialogue on matters of common interest with a view of addressing these issues. It is vital that we attract leading professionals to our committees in order to strengthen our journey. I earnestly invite leading professionals in our community to join IESL and serve in our committee to make a contribution to the engineering profession.

The Executive Committee this year is a great team of engineers full of energy and talents and it was a great pleasure to work with all of them. On behalf of all the members, I would like to thank all of them and their families for the hard work they put in during the year.

Finally, this is your Chapter and its relevancy depends on your participation at all Chapter activities.

I wish you all another great year.

Mahinda Karunaratne

Chair, IESL NSW Chapter
chair@ieslnsw.org,
05/10/2014

Attachments:

The following form part of this report.

- IESL NSW Chapter – 2014 Annual Accounts
- Annexure: 1
- Annexure: 2

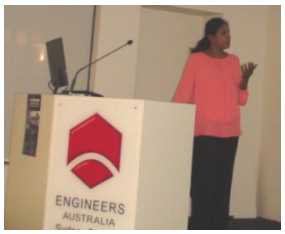
Annexure : 1

IESL NSW Chapter Knowledge Sharing Lectures

During this year (2013-14), IESL NSW Chapter organised four lectures in order to facilitate knowledge sharing on innovative industry initiatives and findings of local research. The presenters represented the researchers in the academia and practitioners of the industry. The topics were diverse but related to the dynamics in industry innovations and research outcomes. The applicability of systems engineering approach for complex engineering projects, and the proposed North West Rail link, the largest public transport infrastructure project currently under construction in the country informed the members on the local dynamics from the perspective of engineering developments in the industry domain. Moreover, research projects on the development of large autonomous machines that have direct industry applications and the design of a farmer-centred ontology for Social Life Networks based on a mobile based shared information system for the agricultural sector demonstrated the implications of academic research for industry development. All these lectures were held in the Engineers Australia Auditorium and well attended by the members of IESL NSW Chapter and Engineers Australia ranging from 40 to over 100 participants per event. These four lectures held in this year are briefly described below.

The first lecture of this year was presented by Eng Nihal Fernando, Technical Specialist at Thales Australia on "Systems Engineering Practices in developing Complex Communications and Electronic Systems" on 30th October 2013. He provided a general description of systems engineering as it is applied in complex engineering projects ranging from safety critical civilian infrastructure to high performance military systems. The systems engineering lifecycle was discussed highlighting important areas of requirement analyses, formulating architectures, technology selection and "Verification and Validation" with real project examples.

The second lecture was from Associate Professor Jayantha Katupitiya, University of New South Wales presented on "Autonomous Machines: how they are built, what makes them work" on 25th February 2014. Autonomous machines are those that make decisions for themselves within a certain stipulated context. They are fast becoming a common place in a general sense; however, there are areas where researchers are still battling significant issues. Among these is highly precise navigation of large vehicles in rough terrain. This lecture provided knowledge on how large machines that operate at relatively high speeds are developed, the essential elements of them and the unrivalled role the control systems engineering play in making them work.



Anusha Walisadeera, a Visiting Fellow at School of Computing, Engineering and Mathematics, University of Western Sydney, Australia presented her research on developing a user-centred ontology for Sri Lankan farmers that includes context-specific information and meets information needs of the farmers at different stages of the farming life cycle. This lecture was held on 16th July 2014. Agricultural alue chain consists of decentralised smallholder farmers in the upstream; these farmers or smallholder farms lack the access to vital information in the decision making process. Addressing this issue, an ontological approach has been designed in a project that aims to use mobiles to provide critical information enabling informed decision-making by Sri Lankan farmers. Its applicability spans over a range of industry applications of shared information systems.

Annexure : 1

The final lecture for this year was done by Adrian Bull, Senior Manager Engineering Assurance & Standards, Transport for New South Wales on "North West Rail Link: Technical Challenges & Current Status" on 27th August 2014. The $8.3 billion North West Rail Link is the Australia's largest public transport infrastructure project currently under construction and a priority rail project for the NSW Government. It will be the first fully-automated rapid transit rail system in Australia. The scope and plan of this project, its technical challenges and implications for commuters were discussed. This lecture was attended by a large audience from the members of both IESL NSW Chapter and Engineers Australia.

Young Engineers Presentations

Young Engineers' Presentations were held on 26th March 2014 with four young engineers presenting based on their areas of expertise. These presentations reflected the diversity of engineering projects in which our young engineers are engaged. The presenters benefited from the useful feedback from experienced engineers.

Eng Madhuka Jayawardhana, a PhD candidate of the University of Western Sydney presented the findings of her research on "Decentralized Structural Health Monitoring using Wireless Sensor Networks". Structural Health Monitoring (SHM) and damage detection techniques have captured much interest and attention of researchers and structural engineers owing to their potential in providing spatial and quantitative information regarding structural damage, and the performance of a structure during its life-cycle. Deployment of these systems in real-world structures presents numerous challenges. Limited sensor energy in the case of wireless sensor networks and the management and communication costs associated with enormous amounts of data collected by any SHM system are two such prevailing issues. Decentralized damage detection of structures is a novel approach that is still being researched on, that has the potential of mitigating both energy and data communication issues. This presentation focused on addressing the said challenges of SHM systems through decentralized damage detection. A decentralized structural damage detection and localization algorithm developed based on the Wiener filter and successfully verified using experimental data obtained from a laboratory structure was presented.

Annexure : 1

The focus of the presentation by Eng Buddhi Wijerathna, A PhD Candidate of the University of Technology, Sydney was on "Advanced Condition Assessment and Failure Prediction Technologies for Optimal Management of Critical Water Pipes". The prediction of a remaining life of a pipe, especially for critical water mains, is important for developing effective renewals programs to manage pipe infrastructure and reducing the incidence of catastrophic failures, which impacts communities. A better understanding of the current condition and performance of buried water mains and sewer pressure mains is an important first step to help achieve improved understanding of remaining life. This has been identified by WSAA members as a high priority for research and collaboration. Despite this, one of the key factors impacting on condition assessment is the lack of data on large pipes. This is not only an issue for Sydney Water and other Australian water utilities, it is an international challenge. An experimental test-bed has been established as part of a larger collaborative research team of Australian and international researchers and a consortium of national and international agencies to improve the technological and financial management of buried water mains. A verification method based on high-resolution geometric 3D laser scans of the exhumed and grit-blasted pipes together with algorithms to extract the pipe wall thickness out of the 3D geometric models, combined with lower-resolution ultrasonic measurements, is proposed to accurately determine the actual thickness of the pipes at a large scale. The set-up has allowed different condition assessment techniques to be applied to understand how their measurements relate to the pipe condition in terms of pitting, corrosion, structure etc., and to enhance their data interpretation with novel data mining techniques.

Eng Deependra Puswella, shared her experience on wastewater treatment plants as a project engineer at NSW Public Works. NSW Public Works plans, designs, maintains and manages construction of much of NSW's public

infrastructure. A project is deemed successful when the management and design processes undertaken on the project is both challenging at times, yet enjoyable, because it ultimately leads to construction of an infrastructure that is beneficial to the community. The community benefits include improved drinking water quality, reduced demand for potable water and/or improvements to the health of the environment. Taralga Sewage Treatment Plant (STP) Scheme utilised a compact configuration Intermittently Decanted Extended Aeration (IDEA) Treatment Plant to improve quality of effluent for irrigation, allowing for no-discharge, whilst providing for a robust process with simple operation and remote monitoring. Young STP and Reuse Scheme – is a Sewage Treatment Plant which utilises IDEA for secondary treatment and Reuse Scheme that allows for 12,500 equivalent persons (EP) capacity. The plant now addresses all deficiencies with the previous plant and provides good quality effluent for both discharge and reuse."

Eng Muditha Pallewattha, a PhD candidate of the University of Wollongong, presented her research project of "Subgrade Soil Stabilisation along Rail Corridors through Native Vegetation". Current demand of the infrastructure facilities along metropolitan areas has led to the construction of earth retaining structures on major highways and railways on soft soils. Hence civil engineers are constantly challenged to discover more cost effective, reliable and sustainable methods for ground improvement. In this case green corridor concept can be considered as a cost effective and environmentally friendly method. Tree roots provide mechanical strengthening to the soil due to anchoring effect of the main roots and by the improvement of cohesion due to hair roots. Moreover tree roots improve the matric suction of soil by means of root water uptake in conjunction with the transpiration of the tree. Therefore an integrated model which captures the both mechanical and suction effects can be used to predict the true effect of native vegetation in soil stabilization.

Annexure : 1

Industrial Visits

Visit to Sydney Water's St Marys Wastewater Treatment Plant

The IESL NSW Chapter organised an industrial visit to Sydney Water's St Marys Wastewater Treatment Plant on 13th March 2014. There are two water recycling plants at St Marys, a conventional Wastewater Treatment plant (WWTP) and a new Advance Water Treatment Plant (AWTP). The WWTP, one of the 38 treatment plants owned and operated by Sydney Water, treats around 38ML/D and is part of a 24,000km long wastewater system. It serves a population of approximately 140,000 within a catchment area of 7,200ha. The AWTP, owned by Sydney Water and operated by a private consortium, takes treated water from three water treatment plants, namely St Marys, Penrith & Quakers Hill, and then treats to a higher degree using membrane technology and discharge around 50 ML/D of highly treated water to the Hawkesbury/Nepean river system.

This tour was attended by 23 members of the IESL NSW Chapter. Wasantha Wickramanayake, Plant Manager of St Marys Wastewater Treatment Plant guided the visitors around the plant and gave a very detailed description of all components of the wastewater treatment process from screening to the licensed discharge point. The knowledge shared in this visit has been greatly appreciated by all the participants including the PhD candidates who pursue their research in the area of wastewater treatment.

From the Editor, IESL NSW Chapter

The editorial activities this year included the publication of three newsletters and the magazine for the Engineers Night and Gala dinner 2014. The newsletter is published to the membership in electronic format every three months and this can also be accessed through the IESL Sydney Chapter website {www.ieslnsw.org}. This year the format and appearance of the newsletter was revised to make it easily readable and also to facilitate easy navigation through the pages.

The first newsletter published in November 2013 included the introduction to the new committee, details of public lectures and an article by Eng Sarath Weerashinghe on "technologies that change the way we live". Our thanks are to Eng. Sarath Weerasinghe for the effort taken in publishing this newsletter.

A detailed message from the NSW Chapter Chair Eng. Mahinda Karunaratne setting out the vision for the IESL was the feature article in the second newsletter published in March this year. This issue also celebrated the election of two engineers as Fellows of the Engineers Australia, Eng. late Kamal Fernando and Eng. Sarath Wijayapala. Associate Professor Dr Jayantha Katupitiya's well received talk on "Autonomous Machines, how they are built and what makes them work" was also featured in this issue along with the industrial visit to the St Mary's Wastewater Treatment Plant.

The 2014 engineering excellence award winners and the celebrated news of the IESL becoming a full signatory to the Washington Accord featured prominently in the third newsletter published in July this year. This newsletter also included a summary of the presentation on "User Centred Ontology for Sri Lankan farmers" – a system aimed at providing agricultural information and relevant knowledge that is complete, specific to the user context and delivered in a structured manner to the users by Anusha Welisadeera, a visiting Fellow at the School of Computing, Engineering & Mathematics at the University of Western Sydney.

I would like to thank Eng. Nalin Seneviratne and Eng. Udeshini Pathirage for a job well done in editing and producing thoroughly professional series of newsletters and the Gala Dinner souvenir. I would also like to thank all those who contributed to the newsletters and helped us in numerous ways during the year.

Annexure 2

IESL NSW Chapter - Engineering Convention 2014

The Institution of Engineers Sri Lanka, NSW Chapter (IESL NSW), concluded its Engineering Convention 2014 -Engineering Conference and the Gala Dinner, in grand style in the last weekend of May. The Convention provided opportunities for networking, recognition of achievements of fellow engineering professionals through engineering excellence award scheme, and helped build the profile of engineering profession.

2014 IESL Engineering Conference

The first part of the Convention, the Engineering Conference was held on 30th May at the Engineers Australia Auditorium in Chatswood. It was well attended and a showcase of our excellence and our contribution to NSW. IESL NSW Chair Eng. Mahinda Karunaratne welcomed the attendees.

The Main highlight of the conference was the presentation of selected submissions for Engineering Excellence Awards 2014. The objective of Engineering Excellence Awards is to recognise the contribution of the engineers of Sri Lankan background living in NSW to ecologically sustainable development, the wellbeing of the community and, the cost effective, innovative and excellent levels of engineering solutions they deliver. This year, there were a large number of excellent submissions in the three categories – the best research paper, the best innovation and the best infrastructure development. The six outstanding submissions were presented at the conference:

The keynote speaker, President of the IESL Eng. Shavindranath Fernando spoke about the achievements of Sri Lankan students in the world arena, expansion of the IESL in Australia with the formation of the new Chapter in Western Australia and future plans for a Chapter in Victoria. Eng. Fernando also highlighted the ongoing development projects in Sri Lanka and the contributions that can be made by experienced engineers from countries such as Australia.

Kaushalya Wijekoon, final year PhD student from University of Wollongong, opened the conference with the presentation on *"A novel membrane distillation - Thermophilic bioreactor system: Biological stability and trace organic compound removal".* This study investigated the removal of micro pollutants during a novel hybrid membrane distillation bioreactor (MDBR).

Salinity build-up to some extent adversely impacted the performance of the bioreactor, particularly the removal of the total Nitrogen (TN) and recalcitrant micro pollutants. However, overall performance of the novel MDBR system with respect to basic water quality and micro pollutants removal was high and independent of the bioreactor performance.

Annexure 2

Namal Yapage, Design Engineer, Keller Ground Engineering, presented next on *"Numerical modelling of geotextile reinforced embankments over deep cement mixed (DCM) columns incorporating strain-softening behaviour of columns".*

Namal presented a constitutive model, which is an extension of the Mohr-Coulomb model, for the simulations of strain-softening behaviour of cement admixed clays. A two dimensional coupled mechanical and hydraulic numerical implementation of a geotextile reinforced DCM column supported (GRCS) embankment constructed over a soft soil in Finland is carried out incorporating strain-softening behaviour of DCM columns. The model simulations show good agreement with field data confirming the capability of the two-dimensional plane-strain finite element model in predicting the GRCS embankment behaviour. The finite element model with strain softening DCM columns is used to investigate the progressive failure of a typical hypothetical GRCS embankment with isolated columns in a square pattern. Results clearly illustrate that the bending failure is the most critical failure mode for internal stability of GRCS embankments in the ULS conditions. This paper has identified some key features to be considered in the development of design procedures for GRCS embankments in the future.

Third presenter was **Priyadarshanie Weeraratne**, Drainage Team Leader with Jacobs/Sinclair Knight Merz, who presented on the Woomargama bypass of the Hume Highway Upgrade project. The Hume Highway Upgrade, Woomargama Bypass project has shortened the Sydney to Melbourne route and replaced single-carriageways, significantly reducing travel times and improving safety. The project involved construction of two new two-lane carriageways to bypass Woomargama village in Southern NSW. The Hume Highway Alliance (HHWA) took a strategic approach for innovation and implementation of a culture that would foster new ideas and set higher standards across the industry for performance improvements in quality, safety and the environment. These innovations provided scope for improved future road and highway construction in NSW as well as in broader geographies.

HHWA has achieved excellence in all the project's key objectives by meeting significant challenges, demonstrating construction excellence and industry best practice through defect free" project completion six weeks ahead of the time deadline, delivered significantly under budget, achieved outstanding results.

The project has been recognised for its world's best practice in erosion and sedimentation control, having won the IECA 2011 award for Environmental Excellence.

Fourth presentation was from **Dammika Vitanage,** Asset Infrastructure Research Coordinator, Sydney Water, who presented on *"The advanced condition assessment and pipe failure prediction project".*

Most major urban utilities in Australia have extensive critical pressure main systems, parts of which have been in service for a century or more. Failure of critical mains has severe impacts in terms of maintaining service levels to customers, loss of fire-fighting supply, safety, transport disruption and other social costs, as well as significant financial and reputational implications.

A better understanding of the condition, performance and prediction of failure of critical water mains was identified by an international team of partners comprising utilities, research organisations and technology providers. The paper presented details of a global collaborative project developed to undertake research into this issue in partnership with local utilities, local universities, international water bodies and pipe condition service providers (www.criticalpipes.com).

Dammika is the water industry representative for this research collaboration which would deliver major savings to the industry and community.

Fifth presenter, **Damith Herath,** co-founder of the robotics start up Robological, presented on *"RoBuddy - Connect your world".*

Ro-buddyTM – Connect Your World is tightly integrated ecosystem for building robots and other mechatronic systems. Ro-buddy microcontroller board provides the hardware interface for connecting various sensors and actuators and the user can then use an Android smartphone or a tablet to control and monitor these devices through the Ro-buddy App.

A key innovation of this ecosystem is the users' ability to design their own control interfaces on their Android devices without writing a single line of software code. The project began as a way to inspire school students to get involved in STEM related subjects by building robots. Damith led the project team on this innovative project.

Annexure 2

Srimathi Ediriweera, Project Engineer in the Bridges and Structural Engineering Branch, Roads and Maritime Services (RMS), presented on "Dunmore bridge structural capacity upgrade".

This project was a major timber truss bridge rehabilitation project undertaken by the RMS. The Bridge & Structural Engineering branch of the RMS completed the structural designs. Key challenges on the project included State Heritage Significance of the bridge structure, and the need for the design to comply with the constraints set by the NSW Heritage office.

In addition the bridge has originally been designed for 16 ton live load, and this was upgraded to serve 44 ton current traffic loading, whilst retaining the original features. Srimathi managed the detailed design of this project which won the Engineering Excellence Award from the Newcastle Division of the Engineers Australia and a High Commendation Colin Crisp Award for Excellence in Heritage Engineering.

The Conference was facilitated by IESL NSW Chapter committee members Dr. Dilupa Nakandala and Dr. Udeshini Pathirage.

The following sponsors were introduced by the Treasurer Eng. Ananda Herath.

Gold Sponsor:

Bronze Sponsors:

Annexure 2

2014 IESL NSW Gala Dinner

This year's Gala Dinner was held on 31st May, it was attended by over 300 people including Mr Aruna Ratnasena representing Consul General of Sri Lanka, Ambassador Bandula Jayasekara, President of the Institution of Engineers Sri Lanka Eng Shavindranath Fernando, and the National President of Engineers Australia Professor Alex Baitch. All of these dignitaries, Chair of IESL NSW Chapter and the gold sponsor opened the Gala Dinner by lighting the traditional oil lamp.

The Chair of the IESL NSW Chapter Eng Mahinda Karunaratne welcoming the attendees highlighted two main objectives of the Chapter, contribution to the engineering profession and knowledge sharing with Sri Lankan engineers and creating opportunities to give back to Sri Lanka. Eng Karunaratne further highlighted the current challenges faced by engineers and focussed on the contributions the NSW Chapter made last year to the Jaffna University and the IESL.

President of the IESL Eng Shavindranath Fernando spoke about the achievements of Sri Lankan students in the world arena, expansion of the IESL in Australia with the formation of the new Chapter in Western Australia and future plans for a Chapter in Victoria. Eng Shavindranath Fernando also highlighted the ongoing development projects in Sri Lanka and the contributions that can be made by experienced engineers from countries such as Australia.

The keynote speech at the Gala Dinner was delivered by the National President of the Engineers Australia Professor Alex Baitch. Professor Baitch outlined the transformation of Engineers Australia that began with the appointment of the new CEO in 2011 to a member focussed world class organisation that is more accessible and relevant in today's context. The process of transformation commenced with the identification of the major stakeholders that included Engineering leaders, CEOs, Employers of engineers, Policy makers, government ministers, Engineering educators, academic deans, Kindred organisations, Members of the engineering profession and the broader community.

Engineers Australia is also focusing on its strategic priorities that include Professional home for life, Connectivity and partnerships, The definitive voice of the profession, Professional credentials and currency, International orientation, Tomorrow's engineer and Business sustainability. Prof. Baitch stated that all these strategic priorities emanate from Engineers Australia's vision i.e. "***Engineers Australia is the trusted voice of the profession. We are the global home for engineering professionals, renowned as leaders in shaping a sustainable world***".

IESL NSW secretary Dr (Eng) Dayan Gunasekara delivering the vote of thanks acknowledged the generous support of the sponsors NSW Public Works (gold) and Bronze sponsors SMEC, Fulton Hogan and JBS&G.

Annexure 2

2014 IESL NSW Engineers Excellence Awards were also presented at the Gala Dinner by the President of IESL, National President of Engineers Australia and Chair of IESL NSW Chapter.

After a Sri Lankan spicy dinner, the attendees were entertained by traditional Cook Islander Dance performance.

Then the floor was open for the engineers and spouses to dance to the vibrating rhythm of Desmond & the Impressions.

The IESL NSW Executive Committee with the IESL President at the Gala Dinner

The Master of Ceremonies Duke Ramachandran kept the sprit of the Gala Night right at the top.