# Newsletter

# THE INSTITUTION OF ENGINEERS SRI LANKA

## Western Australia Chapter

## April 2022

The Institution of Engineers Sri Lanka, Western Australia Chapter 8th Annual General Meeting was held on 14th November 2021 at Centenary Park Pavilion

**The following committee was elected uncontested for the year 2021-2022**

| No | Name | Position |
|---|---|---|
| 1 | Bandula Samarasinghe | President |
| 2 | Asoka Wickramasuriya | Vice President |
| 3 | Mahesh Kariyawasam | Secretary |
| 4 | Muditha De Silva | Treasurer |
| 5 | Dr Senaka Welideniya | Editor |
| 6 | Mathanga Perera | Committee Member 1 |
| 7 | Tilak Jayantha | Committee Member 2 |
| 8 | Yenuli Ranaweera | Committee Member 3 |
| 9 | Chirantha Weerawardena | Committee Member 4 |
| 10 | Vihanga Jayarathna | Committee Member 5 |
| 11 | Percy Yasaratna | Committee Member 6 |
| 12 | Anjelo Ebell | Committee Member 7 |
| 13 | Jayantha Dharmaratne | Committee Member 8 |
| 14 | Lahiru Chandraratne | Committee Member 9 |

## PRESIDENT'S MESSAGE

***BANDULA SAMARASINGHE***

Dear friends and colleagues,

I thank IESL WA membership for requesting me to be the President for the year 2022. I am looking forward to facilitating our energetic committee that represents a wide range of professionals, including young and experienced senior engineers who are top Engineering executives in the WA industry. They have been active from the onset, and I wish to take this opportunity to extend my sincere thanks. I also would like to thank the previous committees for setting high standards and enabling smooth transitions.

This is our first Newsletter for 2022, and I thank Dr. Senaka Welideniya, our editor for undertaking this task, and we are looking forward to bringing you up to date news on IESL WA programs through this newsletter, and our Website. I thank Muditha de Silva, our treasure, who has been instrumental in maintaining the IESL WA website.

Despite the restrictions that were imposed due to prevailing health emergencies, our committee has been able to maintain an active program with the monthly Webinar Series on contemporary engineering topics, which started in February and continues monthly. When the situation eases with restrictions being lifted, we intend to launch our planned activities that include industry visits, career guidance and other workshops, social programs and the annual gala event, the IESL WA Annual Dinner Dance.

I also want to take this opportunity to acknowledge the driving force of IESL WA, Chirantha Weerawardena for all his guidance and support, who has been with the IESL Committee since its beginning as a founding member, holding many committee executive positions including the President. I thank him for remaining in the committee and his continuous guidance and support.

Last, but not the least, to our Secretary, Mahesh Kariyawasam, who is taking the lead in keeping all of us updated with his high organisational skills, and to all our IESL WA Committee members who have welcomed me and created the environment for working together as a cohesive team. Thankful to this conducive environment I will be able to lead many activities that we will be embarking on. I am happy to state that IESL WA have already started realising the benefits through the synergies being created. We all are looking forward to an interesting time ahead together, and to realise benefits to IESL WA membership.

We welcome all your feedbacks and suggestions.

Best regards.
Bandula Samarasinghe

# The Professional

**Professionals need to showcase their knowledge and experiences by presenting at technical conferences and writing journal papers. Presenting papers at conferences and publishing journal papers have countless benefits.**

These forums provide the perfect platform to showcase your expertise to key decision-makers within the industry. This is also your opportunity to give your ground breaking innovative ideas to the industry. New ideas will lead to the development of new products, best practices as well as industry-relevant research. Presenting and publishing will also boost your professional profile, extend your professional network, promote research, influence decision makers and greatly improve your job opportunities.
**Always look for conferences/ journals where you can present/publish your expert work.**

# Australian Mineral Codes

## Brief introduction to The JORC Code and The VALMIN Code

## The JORC Code

The JORC Code is produced by the Australasian Joint Ore Reserves Committee ('the JORC Committee'). The JORC Committee was established in 1971 and is sponsored by the Australian mining industry and its professional organisations. The JORC Committee comprises representatives of each of the three parent bodies: The Minerals Council of Australia (MCA), The Australasian Institute of Mining and Metallurgy (The AusIMM), and the Australian Institute of Geoscientists (AIG); as well as representatives of the Australian Securities Exchange (ASX), the Financial Services Institute of Australasia (FinSIA) and the accounting profession, and an observer from Association of Mining and Exploration Companies (AMEC).

The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) is a professional code of practice setting the minimum standards for public reporting of minerals exploration results, mineral resources, and ore reserves. Reports prepared in accordance with the JORC Code include, but are not limited to, annual and quarterly company reports, press releases, information memoranda, technical papers, website postings and public presentations of Exploration Results, Mineral Resources and Ore Reserves estimates. These reports carry valuable information for investors and their advisors.

The current edition of the JORC Code was published in 2012 (The JORC Code, 2012 Edition) and came into mandatory operation from 1 December 2013. It has been incorporated in the Listing Rules of the Australian and New Zealand Stock Exchanges, making compliance mandatory for listing public companies in Australia and New Zealand (JORC website).

## The VALMIN Code

The VALMIN Committee is a joint committee of The Australasian Institute of Mining and Metallurgy (AusIMM) and the Australian Institute of Geoscientists. The committee was established to develop and maintain the "Australasian Code for Public Reporting of technical assessments and valuations of mineral assets", commonly known as the VALMIN Code. The VALMIN (Valuation of Mineral Assets) Code was first published in 1995, with subsequent editions published in 1997, 2005 and 2015.

The VALMIN Code sets out requirements for the technical assessment and valuation of mineral assets and securities for independent expert reports and provides guidance for petroleum assets and securities. This course will provide the fundamentals and principles of appropriate Public Reporting of technical assessment and/or valuations of mining assets in compliance with relevant laws and for more information go to VALMIN website.

# The IESL (WA) Professional Development Programs

**The IESL primary objective is membership technical development and upskilling. Therefore, on this regard, based on our vision and mission we conduct technical workshops, seminars, study tours and discussion forums. We always stand for our objectives, and nothing can stop us. IESL Committee is keen to go ahead with our agenda braving all the odds. Hence, under the current environment, in the shadow of the pandemic, we have decided to conduct our monthly "Professional Development Lectures" as webinars without any interruption to member aspirations, minimizing physical contacts and complying with our social obligations in keeping WA Safe. The upcoming webinars for the next few months are as follows:**

- **April Workshop/Webinar: Mechanical**

**MACHINE LEARNING, QUANTUM ALGORITHMS AND DATA SCIENCE**

**Dr. Sivaguru S. Sritharan, Chief Technologist, Go.AI, Inc., U.S.A.**

**DATE: 07 April, 2022 (Thursday)**

**TIME: 4.00pm Perth (6.00 pm AEST, 1.30pm Sri Lanka)**

- **May Workshop/Webinar: Mining – Date and title TBA**

***Monthly workshops and webinars that will be announced lately are as follows:***

- ***Civil: TBA***
- ***Electrical and Mechatronics: TBA***
- ***Air Conditioning and Refrigeration: TBA***
- ***Chemical and Process Engineering: TBA***
- ***Aviation Engineering: TBA***
- ***Automobile and Railway Engineering: TBA***
- ***Dams Engineering: TBA***
- ***Roads and Tunnelling: TBA***
- ***Biomedical Engineering: TBA***
- ***Telecommunication Engineering: TBA***

# Interesting Technical Paper Abstracts

**This paper outlines technical commitments and responsibilities we hold towards the world and community as practicing engineers**

## MOUNT POLLEY TAILINGS DAM FAILURE INVESTIGATION CONCLUDES THREE ENGINEERS DISCIPLINED Posted on March 11, 2022

**https://www.egbc.ca/getattachment/46fbc417-cea8-48c3-8240-c2a0cd7a7b95/Mount-Polley-Investigation-Concludes-Three-Enginee.aspx**

Engineers and Geoscientists British Columbia, the regulatory and licensing body for the professions of engineering and geoscience in BC, has concluded its disciplinary proceedings against three individuals in relation to their work at the Mount Polley Mine. The multi-year investigations were initiated following the breach of the mine's tailings storage facility on August 4, 2014.

Three current and former engineers involved at the Mount Polley Mine Tailings Storage Facility (TSF) face a range of penalties arising from the disciplinary proceedings:

- Former engineer Todd Martin,
- Engineer Laura Fidel, P.Eng. and
- Former engineer Stephen Rice.

Engineers and Geoscientists BC is responsible for establishing and upholding standards of professional practice and ethical conduct for the professions. If the regulator determines that an engineer or geoscientist may have breached these standards, it takes action through a comprehensive investigation and discipline process. These cases represent some of the most complex investigations Engineers and Geoscientists BC has undertaken. During the course of its investigations, the regulator reviewed thousands of documents including contracts, technical reports and drawings, correspondence, and daily site reports.

"This marks the final chapter in a long and difficult story for our province and our professions," said Heidi Yang, P.Eng. CEO of Engineers and Geoscientists BC. "Over the past several years, our focus has been on delivering a comprehensive, rigorous, and fair process, and we're pleased to be able to provide the public with these results. The conclusion of these cases, combined with resources we've developed to improve dam safety, will strengthen our professions and our province's environmental safeguards."

Following the breach, Engineers and Geoscientists BC took actions to improve dam safety in BC, which included producing professional practice guidelines for site characterization for dam foundations in BC, updating existing guidelines to confirm the duties of the "Engineer of Record," and holding professional development seminars. Engineers and Geoscientists BC is also currently updating its guidelines on legislated dam safety reviews. Engineers and Geoscientists BC has also recently been granted the authority to regulate engineering and geoscience firms – a new regulatory responsibility that will enhance its ability to protect the public and address standards of conduct and practice at the organizational level.

"The ability to regulate firms that provide engineering and geoscience services is an important regulatory tool that will enable us to improve public safety and confidence in the engineering and geoscience professions, ultimately resulting in stronger regulation and a safer British Columbia," said Yang. "Our robust regulatory framework will enhance public protection by introducing established standards of practice for all firms engaging in professional engineering and geoscience, which will be enforced through regular audits to ensure compliance."

In the course of these disciplinary proceedings, Engineers and Geoscientists BC did not make allegations or findings as to the cause of the embankment failure. That matter was separately addressed in reports of the Mount Polley Independent Expert Engineering Investigation and Review Panel and the Chief Inspector of Mines.

**CASE SUMMARIES**

These cases were conducted under the legislation in place at the time the engineering work was undertaken (the Engineers and Geoscientists Act), which allowed for a maximum fine of $25,000. That legislation has since been repealed and replaced by the Professional Governance Act, which allows for fines of up to $100,000 for individuals and $250,000 for firms.

**TODD MARTIN**

Mr. Martin was the senior geotechnical engineer responsible for the geotechnical engineering work at the Mount Polley Mine TSF (March 2011 to December 2012). In the Consent Order, Mr. Martin admitted to some of the allegations that aspects of his engineering work were not consistent with prudent engineering practice, including his failure to recommend drilling from the 2011 embankment crest into soils under the footprint of the TSF perimeter embankment to improve the characterization of embankment foundation soils. Mr. Martin further admitted that he failed to make a record of important field observations in 2011, a matter which constitutes unprofessional conduct.

**Mr. Martin agreed to pay a fine in the amount of $25,000 and $69,000 toward the legal costs of Engineers and Geoscientists BC. Mr. Martin ceased practicing engineering in 2018 and resigned his engineering license in January 2020 and accordingly is no longer permitted to practice professional engineering or geoscience in British Columbia. Should he ever re-apply for registration, the Consent Order identifies the steps Mr. Martin will have to take to successfully be licensed.**

**LAURA FIDEL, P.ENG.**

A Discipline Hearing Panel found that Laura Fidel, P.Eng., committed several acts of unprofessional conduct in relation to her engineering work at the Mount Polley Mine TSF. The Panel found that Ms. Fidel failed to ensure sufficient observation and monitoring of the tailings dam while acting as Engineer of Record, including by failing to ensure sufficient site visits and failing to monitor seepage flows which could provide evidence of a potentially unsafe condition within the embankments. Ms. Fidel also failed to ensure that an excavation left unfilled at the toe of the embankment was assessed to determine what impact it may have on the stability of the embankment and demonstrated unprofessional conduct by sealing design drawings for the Stage 9 embankment raise without undertaking sufficient review of the design which was not prepared by her.

**In its penalty decision, the Panel ordered Ms. Fidel's registration as a professional engineer be suspended for a period of two months. In addition, Ms. Fidel was ordered to complete three education courses relating to tailings management, tailings facility design and operation, and engineering management for mine geowaste facilities.**

**STEPHEN RICE**

A Discipline Hearing Panel found that former engineer Stephen Rice committed several acts of unprofessional conduct in relation to his engineering work at the Mount Polley Mine TSF. The Panel found that Mr. Rice failed to properly fulfill the role of review engineer, demonstrated unprofessional conduct by allowing a junior engineer who had little experience with embankment design (Laura Fidel, P.Eng.) to act as Engineer of Record for the project, failed to ensure sufficient observation and monitoring of the tailings dam, failed to document his review work, and failed to ensure an excavation left unfilled at the toe of the embankment was assessed to determine what impact it may have on the stability of the embankment.

**The Panel imposed a $25,000 fine, and Mr. Rice also agreed to pay $107,500 in legal costs to Engineers and Geoscientists BC. Mr. Rice resigned his engineering license in January 2018 and is no longer permitted to practice professional engineering in British Columbia. Should he ever re-apply for registration, he would face a two-year suspension and would need to comply with remedial and supervisory measures before he could successfully be licensed.**

# EARTHQUAKE MAP OF AUSTRALIA

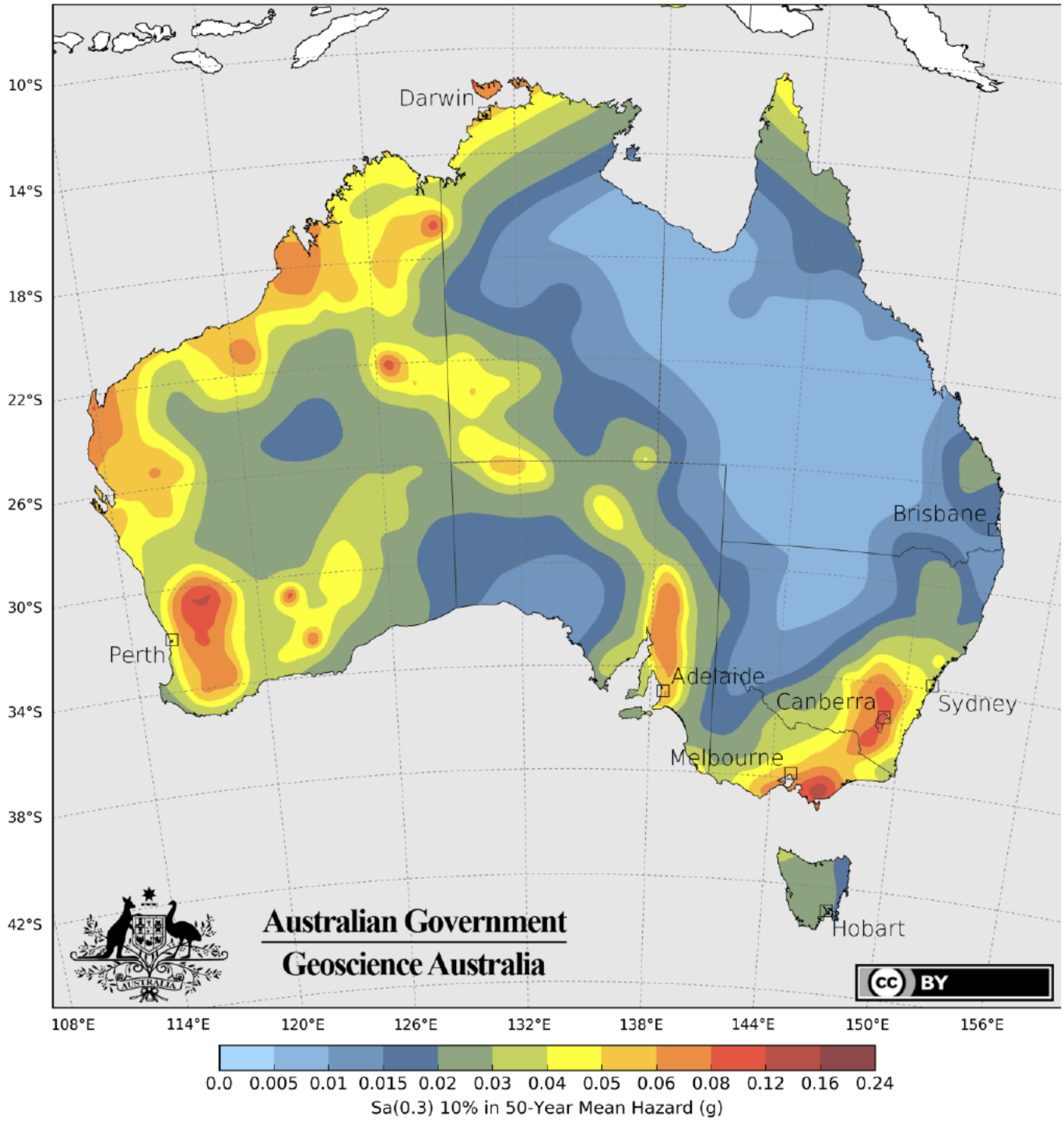


*Figure 6: NSHA18 hazard map indicating the mean Sa(0.3-second) (in g) for 10% probability of exceedance in 50-years on AS1170.4 Site Class $B_e$ (equivalent to $V_{S30}$ = 760 m/s).*

**This is the natural earthquake map. We should also know there is induced seismicity caused by human actions such as mining, dams and reservoirs, etc. This aspect is not covered on this Seismic Map of Australia (https://www.ga.gov.au/).**

# MACHINE LEARNING, QUANTUM ALGORITHMS AND DATA SCIENCE

***Presenter***

## Dr. Sivaguru S. Sritharan,

**Chief Technologist, Go.AI, Inc., U.S.A.**

**DATE: 07 April, 2022 (Thursday)**

**TIME: 4.00pm Perth (6.00 pm AEST, 1.30pm Sri Lanka)**

***Via Zoom***

https://us02web.zoom.us/j/84430711068?pwd=YVVFTHlRQjY0dm04angrZEFrWlVBdz09

Meeting ID: 844 3071 1068 Passcode: 407316

## Presentation Highlights:

- Peceptrons, neural networks and deep learning in a historic perspective
- Physics informed neural networks
- Neuromorphic computing and spin glass dynamics.
- Quantum algorithms and open quantum systems.
- Understanding higher dimensional data: geometry, topology, and geometric evolutions.

## About the speaker

Dr Sivaguru S. Sritharan had his high schooling at Jaffna Central College, Sri Lanka. He then joined at University of Sri Lanka (Peradeniya) and obtained a BSc (Honors) degree in mechanical engineering with first class honors. He started his academic career as an Assistant Lecturer at Faculty of Engineering, University of Sri Lanka (Peradeniya). Then he proceeded to obtain a Master of Science degree in aeronautics and astronautics from University of Washington and a master's degree and Ph.D. in applied mathematics from University of Arizona.

Dr. Sritharn has held several academic and research positions in several Universities and NASA and currently the Chief Technologist at DoAI.Inc. in Dayton, Ohio, United States.

Recently held leadership positions by Dr. Sritharan include Vice Chancellor, Ramaiah University of Applied Sciences, Bengaluru, India and Provost and Vice Chancellor, U. S. Air Force Institute of Technology, Dayton, Ohio, and Dean of Engineering and Applied Sciences at U. S. Naval Postgraduate School, Monterey, California. He has extensively published in fluid dynamics, control theory and stochastic analysis.

**Mechanical Engineering Subcommittee**

**The Institution of Engineers Sri Lanka, Western Australia Chapter**

# UPCOMING CONFERENCES AND EVENTS

## GOLD PLANT OF THE FUTURE SYMPOSIUM 2022 / BLUE MOUNTAINS, NSW AND ONLINE 11 - 12 MAY 2022

**Gold Plant of the Future Symposium 2022 jointly organized by the AusIMM and Gold Technology Group at Curtin University.**

This two-day event will feature many international experts in gold processing which will focus on processing technology, sensors, automation, ESG and related issues. The first day will focus on current and emerging practice and the second day on identifying longer term technology needs and strategic thinking. The symposium will also provide a platform for industry and academia to actively engage and develop best practices for the current and future world's gold plants, providing support for design concepts, commercialisation and commissioning of new technologies.
This is a hybrid symposium where delegates can attend in-person and online.

## WHS ACT 2020 AND WHS REGULATIONS 2022

After 38 years, West Australia's work health and safety laws will be modernized and the Work Health and Safety Act 2020 and regulations will commence March 31, 2022

A national first, the new laws bring together WHS for general industry, mines and petroleum operations under a single act. The new laws recognise modern work relationships such as subcontractors and gig economy workers, and introduces the term 'person conducting a business undertaking' (PCBU). Therefore, anyone who engages a WA worker has a duty to protect their health and safety, mentally and physically.

WA's new laws harmonise with other States and Territories, except Victoria, although amendments have been made to tailor the laws to reflect our unique State. This means companies that operate across Australia will have similar obligations and requirements in each State and Territory. The new laws confirm that officers (senior decision makers) must exercise due diligence to ensure compliance with the laws, ensuring that the responsibility for workplace safety sits with those at the top of an organisation's hierarchy.

**Industrial manslaughter laws will also begin, carrying a maximum penalty of 20 years imprisonment and a $5 million fine for an individual, and a maximum $10 million fine for a body corporate.** Insurance will no longer cover penalties, ensuring that persons conducting a business undertaking are held accountable for their actions and are responsible for financial penalties.

**The link:** Introduction to WHS laws | Department of Mines, Industry Regulation and Safety (dmirs.wa.gov.au)

**The End**