Hydrogen Safety & Hazardous Areas Conference

7th & 8th August, 2024
Parmelia Hilton
Perth, Western Australia

9th August, 2024
Static Electricity in Hazardous Areas
Half Day Workshop

Presented by
IDC Technologies

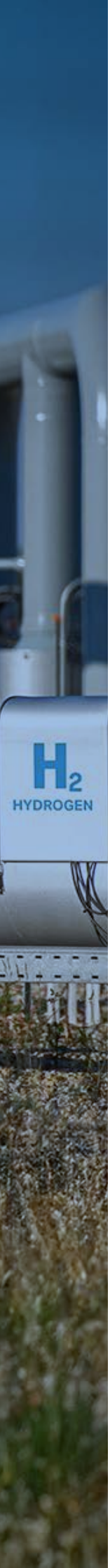
Education Partner
EIT
Engineering Institute of Technology.

Soirée Sponsor
TOTAL-EX

Gold Sponsor
TEKSAL SAFETY

Silver Sponsor
BARTEC

Supporting Sponsors
HSA Hydrogen Society of Australia
BUSINESS EVENTS PERTH



Introduction to Hydrogen Safety & Hazardous Areas

The upcoming IDC Conference in Perth, Western Australia, will bring together industry experts and thought leaders to discuss the latest developments and challenges in Hydrogen and Hazardous Areas within Australia and New Zealand.

This two-day event will feature keynote presentations from renowned experts in the field, including:

- Amy Philbrook, Clean Fuels Technical Lead for Australasia at Arup, who will share her insights on "Pathways for Improving the Economics of Renewable Hydrogen."
- Michael Marrington, Operations Manager at IndEx, who will provide a practical approach to "Hydrogen Safety."

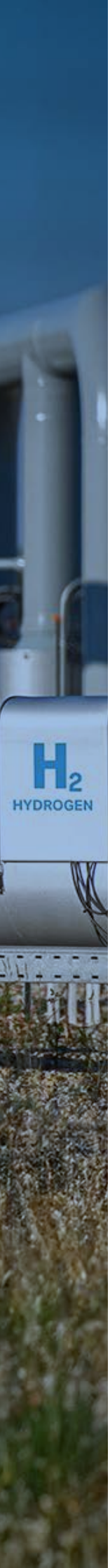
Renewable hydrogen is a game changer and the flagship of the net zero transformation stream. Australia is well-placed to produce green hydrogen at internationally competitive prices. As this fast-paced industry evolves, it has never been a more important time to stay up to date. The key developments will be delivered by subject matter experts, industry leaders and government during the two-day event.

The IDC Conference provides a unique opportunity for professionals and organisations working in the hydrogen and hazardous areas sectors to unite, share knowledge and network.

The event will focus on Australia and New Zealand and address the region's challenges and opportunities in this rapidly evolving field.

The Benefits of Attending

- To learn about the recent approaches to hydrogen production which involve cost reductions.
- To hear from a feasibility study on transitioning from diesel-based power systems to 100% renewable energy.
- To get an update on the standards. Standards Australia has embraced thirteen hydrogen-specific standards from international bodies (ISO and IEC), aligning with global best practices and ensuring consistency with international norms.
- To hear from experienced operators of green hydrogen projects.
- To learn how to implement electrolyser safety in hydrogen production processes.
- To understand the specific treatment required to achieve safe feedwater for hydrogen electrolysers.
- To hear about a breakthrough in low-emission hydrogen and graphite production.
- To learn - from the regulator - about equipment selection, and what they look for onsite.
- To understand how to address safety and risk reduction associated with static electricity and lightning in hazardous atmospheres.
- To learn how to deploy processes, tools, and technologies to safely detect and manage hydrogen throughout the value chain.
- To hear from key stakeholders who will share best practices which address site-specific challenges.

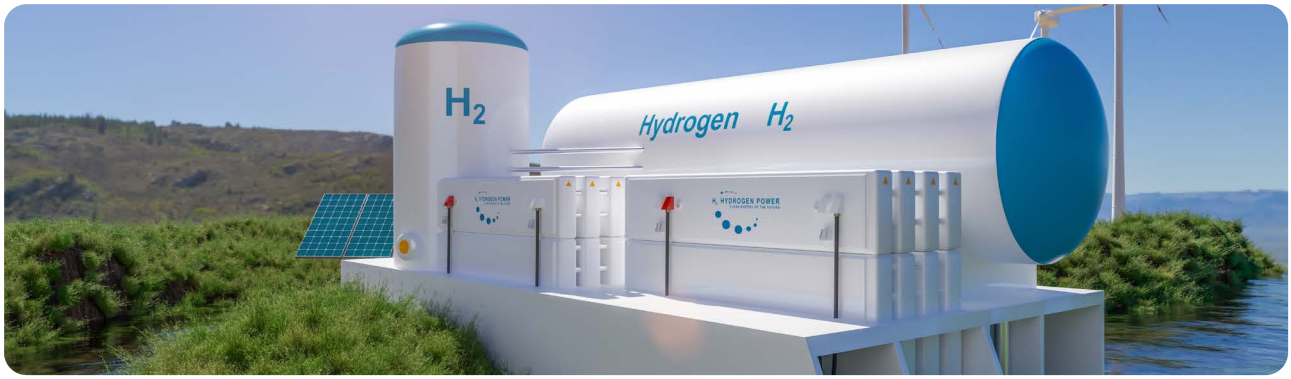


About IDC Technologies

For the past thirty years we have run practical conferences globally, focusing on technical outcomes which are useful, practical, and relevant.

We pride ourselves on a legacy of holding our events around the world , in Australia, New Zealand, Singapore, the United Kingdom, Ireland, India, the USA, Canada, and South Africa, with thousands of professional engineering delegates attending over the years. Our clientele is diverse; including Rolls Royce, NASA, and BP, to name a few. This attests to our reputation as a leader in engineering professional development, with cutting-edge engineering advances directly benefitting you.

We are a sister company to the well-known engineering college, the Engineering Institute of Technology (EIT), with over 4,000 students currently studying professional development micro-credentials, diplomas, and undergraduate and postgraduate degrees, including a Doctor of Engineering. Most students are working in the engineering industry in the 160 countries we have reached since 2008.



2024 Keynote Speakers

Amy Philbrook, PHD

Amy Philbrook is a chemical engineer with a PhD in chemistry, and extensive experience in scientific research and technological development pathways. She holds various technical advisory roles and is the Australian representative to the International Energy Agency Task 44. Amy is also a director of Hadean Energy, a tubular Solid Oxide Electrolyser (tSOE) company. She is the Clean Fuel Technical Lead at Arup, and is focused on hydrogen, bioenergy and sustainable aviation fuels.

International Keynote | Michael Marrington

Michael Marrington is a distinguished expert in hazardous areas (IECEx, ATEX, CompEx, EEHA, UL STP & NFPA 505 Committee Member), specialising in applying hydrogen systems to industrial processes. He has a wealth of experience encompassing a wide range of sectors, including furnaces, gas turbine generators, electrolysis, feedstock, and the ground-breaking implementation of the world's first gas hydrogen passenger ferry (The Sea Change).

He has an extensive knowledge of hydrogen technologies, combined with a deep understanding of safety regulations and compliance requirements, but retains a practical approach. This has enabled him to successfully navigate the complex landscape of hazardous environments. Driven by a keen understanding of human factors, he significantly advances personnel competence to ensure that hydrogen is safely and efficiently integrated into processes.

Conference Program

Day One | Wednesday 7th August, 2024

8:30am Session One | Keynote Presentation

Pathways for Improving the Economics of Renewable Hydrogen

Amy Philbrook: Clean Fuels Technical Lead for Australasia, *Arup*

Since the release of the under $2/KG target in 2019, the cost of renewable hydrogen production continues to be uneconomic and is significantly more than the $2 target. Electricity is the key cost contributor to the Levelised Cost of Hydrogen (LCOH) in Australia.

Emerging hydrogen production technologies present pathways to reduce the cost of hydrogen, and include technologies requiring less electricity, like Solid Oxide Electrolysers (SOE). The deployment of new hydrogen technologies requires careful consideration of safety standards. This presentation will focus on the impacts of emerging hydrogen technologies on Australian safety procedures and best practices.

10:00am Morning Tea

10:30am Session Two

A study on a Stand-alone Hydrogen-enabled Power System for Homeland Communities in Regional Western Australia

Furat Dawood: Chair of the HSA-WA Chapter, *Hydrogen Society of Australia (HSA)*

A 100% renewable energy (RE) stand-alone power system can be achieved using a resilient RE storage system which provides a sufficient and stable power supply. This study involved a techno-economic evaluation: a hydrogen-enabled microgrid replaced a diesel-based power system in a medium-scale Homeland Community (1.5 MWh/day), in the Pilbara, WA. Several scenarios were considered in the modelling for the optimal option in terms of the cost of energy, autonomy and GHG emissions reduction. It was found that having a diesel generator backup with a tiny percentage (1.5%) of fossil fuel penetration was the most robust and cost-effective option.

11:15am Session Three

Lessons Learnt from HyP SA Operations

Andrew Hynes: Head of Facilities, *AGIG*

The Australian Gas Infrastructure Group (AGIG) is Australia's major energy infrastructure organisation, with assets valued over $9 billion, delivering natural gas to more than 2 million customers. AGIG is pioneering the transition to renewable gas through various projects, notably the Hydrogen Park South Australia (HyP SA), which has been operational since May 2021. HyP SA is a demonstration plant that produces renewable hydrogen and blends it into the gas network. The plant features a 1.25 MW electrolyser capable of producing 20 kg of hydrogen per hour, initially blending 5% hydrogen into the network for 700 connections, expanding to 4,000 connections and a 10% blend by 2024.

Challenges include electrolyser support, electrical energy inrush issues, operational resource needs, water quality management, and equipment reliability. Despite these, HyP SA has produced over 32,000 kg of hydrogen and injected 4,000 kg into the network, advancing AGIG's renewable hydrogen goals.

12:00pm Lunch

1:00pm Session Four

Hydrogen Safety in an Operating Facility

Adrian Hansen: Senior Process Safety Engineer, *Yara Pilbara*

Yara Pilbara has 20 years of experience producing hydrogen and ammonia in WA, built on over 110 years of global experience. Now, Yara Pilbara, in partnership with Engie, has begun construction of a 10MW solar-powered electrolyser to produce green hydrogen in the Pilbara. The project YURI, with funding from ARENA, will contribute to developing a green hydrogen economy in Australia.

While green sounds great, it is not a walk in the park. Adrian will present the challenges and achievements of Yara Pilbara's experience operating an existing hydrogen plant and the nuances of adding a green hydrogen facility.

1:45pm Session Five

Comparing the Process Safety properties of GH2 vs LH2

Derek Cross: Team Lead, *Gexcon Australia*

We often get asked, "Is gaseous hydrogen or liquid hydrogen safer?". As with many areas of process safety, there isn't really one simple answer. Instead, the response is usually, "It depends!".

In this presentation, Derek will discuss the properties of compressed gaseous hydrogen and liquid hydrogen in relation to process safety. He will discuss where the properties are similar and where they differ and the process safety implications of those differences. With respect to hydrogen, the presentation will cover process safety events such as dispersion, jet fires, pool fires, explosions, BLEVEs and Rapid Phase Transition.

2:30pm Session Six

Boc's Safety Expertise in New and Emerging Hydrogen Opportunities

Shane Whalley: Project Manager at BOC South Pacific, *A Linde Company*

Hydrogen versus Battery? BOC (a Linde Company) aims to demonstrate real-world, in-operation technology that provides an alternative to emissions-free transport. Shane will cover the typical pieces that form a Hydrogen Refuelling Station (HRS), protocols that limit the refuelling process, and key safety, design, and operation considerations, based on the exploration of existing HRS units in their natural habitat.

3:15pm Afternoon Tea

3:30pm Session Seven

Water Treatment for Electrolysers

Dr Mathew Francis: Director of Water Chemistry, *Moerk Water*

The feedwater to both PEM and alkaline electrolysers must be pure because low-quality feedwater can risk potentially catastrophic failure in electrolysers. This presentation will outline the water treatment technologies required to achieve safe feedwater for hydrogen electrolysers. Feedwater types and their impact on ultrapure water treatment systems will be examined, along with how the required flow rates are calculated. The presentation will also outline other water sources used onsite during hydrogen production. It will include water cooling, and how wastewater from the purification process can be reused to reduce the total water inventory.

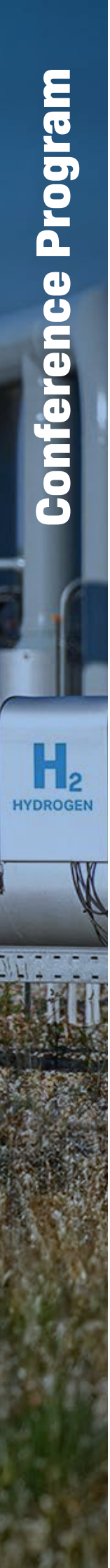
4:15pm Session Eight

Hazer's Hydrogen & Graphite Demonstration Plant

Mark Edwards: Chief Operating Officer, *HAZER Group Limited*

Hazer Group is an ASX-listed (ASX:HZR) technology company undertaking the commercialisation of a low-emission hydrogen and graphite production process via methane pyrolysis. This new technology converts methane feedstocks, such as natural gas or biogas, into hydrogen and graphite by using iron ore as a process catalyst. The carbon in the gas is captured as a saleable graphite product rather than a waste CO2. The technology originated at the University of Western Australia. In January 2024 the company announced the first hydrogen and graphite production from its Commercial Demonstration Plant in Perth. Hydrogen safety and hazardous area design are critical considerations in the plant's design and operation. This presentation will provide an insight into Hazer's journey of design and the approval of a plant which is making hydrogen amidst a local industry and regulatory system in the early stages of development. It will include some misperceptions about hydrogen safety.

5:15pm Sponsor's Soirée (Parmelia Hilton Perth)



Day Two | Thursday 8th August, 2024

9:00am Session Nine | Presentation & Panel Discussion

Department of Energy, Mines, Industry Regulation and Safety (Presentation & Discussion):

When the Regulator Comes Knocking

Steve Emery: General Manager, *Hydrogen and Alternate Energy Safety*

When your Hydrogen site is commissioned, you will receive regular visits from the DEMIRS Dangerous Goods/Major Hazard Facilities inspectors. So, what happens? What are they going to look for? How do you deal with them? Steve will present what an inspection looks like from the Inspector's point of view and provide an insight into some things that should be done and some things to avoid, when the Inspectors come calling.

WHS Regulatory Requirements and Processes for Plant Registration

Karthik Preyeswary: Senior Inspector Engineer, *Department of Energy Mines Industry Regulation and Safety*

This presentation will serve as a guide for industry professionals tasked with registering a plant for use in a workplace. It outlines the WHS regulatory requirements and processes for plant registration, design registration, inspection of plant by competent persons, plant safety and the related requirements. Karthik will also provide clarity around the registration process, and the duties of applicants, designers, design verifiers, manufacturers, importers, suppliers, installers, and competent persons who provide services relating to work health and safety.

What are the gas fitters license requirement that falls within the legislative boundaries of 'Gas Standards Act 1972'

Anitha Gandhi: Principal Engineer Gas Building and Energy Division, *Department of Energy, Mines, Industry Regulation and Safety*

Legislative definition of gasfitting work in Western Australia?

The scope of work such as on-going servicing that requires a licensed gasfitter to undertake gasfitting work in Western Australia;

What type of gasfitting work should a proponent be applying?

What type of information is required for a licensing outcome?

When and how does the Hydrogen appliance re-certification trigger?

10:00am Morning Tea

10:45am Session Ten

Ensuring Hydrogen Safety in Australia's Hydrogen Industry

Scott Brownlaw: *Standards Australia*

Australia is poised to become a prominent player in the global hydrogen market. With abundant renewable energy resources, a solid track record in energy exports (especially in coal and liquefied natural gas), and strategic geographical proximity to key trading partners like Japan and South Korea, the potential for growth in Australia's hydrogen economy is significant. However, as this industry expands, Scott will explain why we must not overlook the crucial aspect of safety.

Despite our knowledge of hydrogen's explosive properties, there has been a limited focus on safety measures concerning large-scale hydrogen production, transportation, storage, and usage. Scott will outline the importance of establishing robust safety standards and practices to ensure the responsible growth of Australia's hydrogen industry as we reduce our dependence on fossil fuel exports.

11:30am Session Eleven | International Keynote

Hydrogen Safety and The Re-Alignment of 'De-Carbonization' Expectations

Michael Marrington: Operations Manager,
IndEx - Hazardous Area Ex Professionals

Within the late 20th century and early 21st century there has been a sustained drive to utilize hydrogen as an alternative energy source, to wean humanity's dependence on carbon-based energy sources.

Within the past 524 years many 'firsts' for hydrogen have taken place. The first observations of hydrogen were by Paracelsus (1520), followed by its first distinct identification by Henry Cavendish (1766). The first process of electrolysis was by William Nicholson and Sir Anthony Carlisle (1800), and witnessing the first fuel cell effect was by Christian Friedrich Schoenbein (1839). This was followed by the development of the first hydrogen internal combustion engines by Rudolf Erren (1920s).

With recent decisions by the USA EPA to remove 'Green' hydrogen from their greenhouse emissions plan and the UK discontinuing the 'hydrogen home heating plan' many would point to 'The writing is on the wall.'

Michael will discuss the new and exciting hydrogen uses and sources, ranging from 'White' & 'Gold' Hydrogen and Cold Fusion (such as, International Thermonuclear Experimental Reactor). He will describe how these can be utilized, but coupled with explosion protection, to ensure a safe and sustainable low carbon future.

12:30pm Lunch

1:30pm Session Twelve

Static Electricity Control & Lightning Protection in Hazardous Areas

Carmello (Cem) Novella: Managing Director, *Novella Group Pty Ltd TA Static Electricity Control*

Hazardous atmospheres exist due to flammable liquids, gases, combustible dust and fibres. No matter how the explosive atmosphere is classified, all potential ignition sources must be eliminated, with static electricity and lightning perhaps being the most insidious.

Static electricity is the prime culprit for at least two serious fires or explosions in industry worldwide every day of the year. In Australia alone, static electricity causes an average of 28 industrial incidents each year, resulting in injuries and fatalities, millions of dollars in property damage, lost production or plant downtime, and environmental release issues.

Lightning causes industry closures worldwide every day of the year. In Australia alone, lightning results in production, plant or process closure, costing millions of dollars in downtime and recovery losses. In light of this, how can we better design and protect hazardous area facilities and processes from static electricity and lightning?

Carmello will explore how AS/NZS 1020, AS 1768, and newly adopted SA TS 60079-32-1 standards affect the Australian and New Zealand hazardous area landscape? He will explain what you must know to minimise the risks of static electricity and lightning in your workplace.

2:15pm Session Thirteen

Hydrogen Leakage Safety Risks

Satiesh Muniandy: Principal Risk Engineer, *Draeger Australia Pty. Ltd.*

Hydrogen is an elusive gas with many unique characteristics, making it challenging to manage. For starters, hydrogen is 14 times lighter than air, has a large flammability range, is odourless, burns with an invisible flame and can self-ignite due to its low ignition energy. Various processes, tools and technologies can be deployed to safely detect and manage hydrogen in the value chain.

Satiesh will explain why their extensive project execution experience in this field has helped them understand that every site is unique and poses various challenges. He will also outline why the right subject matter experts, early in the design phase, are critical to close the safety gaps. The presentation will discuss the hierarchy of control for hydrogen and the technologies that can be deployed to safely manage hydrogen in the value chain. It will also contain lessons learned and the do's and don'ts based on real case studies.

3:00pm Afternoon Tea

3:30pm Session Fourteen

Can Artificial Intelligence Improve Safety in Hazardous Areas?

Vince Pacecca: Chief Scientific Officer, *Risk Management Technologies*

This presentation will outline how the advancements in artificial intelligence (AI) have opened new avenues for predicting and mitigating risks associated with hazardous areas. By leveraging machine learning algorithms and data analytics, AI can analyse vast amounts of historical and real-time data to identify patterns, detect anomalies, and forecast potential hazards in industrial environments. From monitoring gas concentrations to assessing equipment performance and worker behaviour, AI-driven predictive analytics offer the potential to enhance safety measures, optimize resource allocation, and prevent accidents in hazardous areas. However, Vince will explain why the challenges, such as data quality, model interpretability, and regulatory compliance must be carefully addressed to realize the full potential of AI in risk prediction and management within hazardous environments.

Day Three | Friday 9th August, 2024

Half-Day Workshop

Facilitator: Cem (Carmello) Novella

Static Electricity in Hazardous Area Workplaces: Ensuring Safety and Compliance

IDC and EIT have engaged the services of SEC to present at this year's Hydrogen and Hazardous Area Conference. Due to popular demand, the Managing Director of SEC, Cem Novella, will be presenting a workshop on static electricity.

When you consider that static electricity is the cause of many Australian workplace injuries, fires and explosions and more recently 2 fatalities in Victoria, it is quite concerning that most Australian workplaces are unaware of their compliance requirements relating to Australian law and standards, specific to static electricity control.

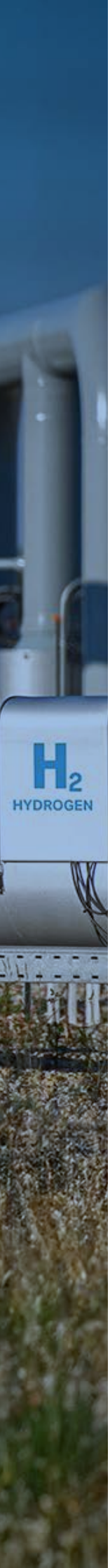
Is your workplace compliant?

This workshop will take an in-depth look with one of Australia's leading auditors and investigators of static electricity, at a typical example of a hazardous area workplace to better understand compliance and non-conformance. Take this valuable knowledge back to your workplace and begin the important task of protecting your site from static electricity in accordance with Australian law and standards.

This workshop is hands on. See examples of non-compliance specific to static electricity in hazardous area workplaces but more importantly learn how to identify them and how to apply the appropriate control.

See how an audit investigation applies specific tests to determine static electricity compliance. See what test equipment is used by the auditor to determine compliance.

If you are concerned about static electricity at your workplace or are undertaking a project and would like to better understand the hazard that static electricity presents. Don't miss this workshop opportunity.



General Information

Conference Venue & Accommodation

Parmelia Hilton Perth
14 Mill Street, Perth, 6000
Hotel: +61 8 9215 2484
Web: www.hilton.com

For conference delegate hotel bookings please click this link for discounted rates.
Available Rooms - Parmelia Hilton Perth

Food and Beverages

Your delegate registration includes all lunches, morning and afternoon refreshments, and the networking soiree.

Tickets & Registration

Conference Only

Early Bird Offer - 10% Off
Single ticket
$1,530.00* per person
Save 10% when you book **on or before 30th June, 2024*

Standard Pricing
Single ticket
$1,700.00* per person
When you book **after 30th June, 2024*

Conference & Workshop

Early Bird Offer - 10% Off
Single ticket
$1,830.00* per person
Save 10% when you book **on or before 30th June, 2024*

Standard Pricing
Single ticket
$2,000.00* per person
When you book **after 30th June, 2024*

Workshop ticket transferrable to another colleague within your company. To book the conference and workshop. For group bookings of more than two people please contact the organiser with your request at conferences@idc-online.com