

Hydrogen Safety & Hazardous Areas Conference



4th & 5th December, 2023
Sandton, South Africa

Presented by



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Introduction to Hydrogen Safety & Hazardous Areas South Africa

Power outages and load shedding have been a significant issue in South Africa in recent years. The Hydrogen Safety & Hazardous Areas Conference brings together key organisations and speakers who are invested in the hydrogen industry in South Africa, and in finding solutions to the energy crisis.

This conference provides a platform to raise awareness of hydrogen safety and the potential hazards associated with producing, handling, storing and using it. The event is designed to educate all who work in the industry and who have a vested interest in it. It covers best practice, the regulations, and the safety measures available to mitigate risks.

As an abundant renewable resource South Africa has been exploring and perfecting the use of hydrogen as an energy source. Hosting a conference on hydrogen and safety in South Africa will encourage the development of the industry by attracting national and international experts, fostering collaborations, and facilitating knowledge exchange.

Delegates will gain insights, knowledge and skill into the latest advancements, through case studies, and the practical experiences shared by industry experts.

As hydrogen gains traction as an energy carrier, it becomes crucial to establish a robust regulatory framework to ensure safety standards are met. The conference will serve as a platform to discuss and refine regulations specific to South Africa's local conditions, infrastructure, and market needs.

Bringing together industry professionals, researchers, policymakers, and stakeholders at a dedicated event will allow for networking and collaboration opportunities. It will enable participants to connect with like-minded individuals, form partnerships, and explore potential business opportunities within the hydrogen sector.

Safety concerns are often a significant barrier to the widespread adoption of modern technologies. This conference will help address negative public perception, build trust, and install confidence in the safe deployment of hydrogen technologies in South Africa.



Your Keynote Speakers

International Keynote | Michael Marrington

Operations Manager | IndEx - Hazardous Area Ex Professionals

- › Distinguished expert in hazardous areas (IECEX, ATEX, CompEx, EEHA, UL STP & NFPA 505 Committee Member),
- › Specialising in the application of hydrogen systems for industrial processes.
- › 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).
- › Extensive knowledge of hydrogen technologies, combined with a deep understanding of safety regulations and compliance requirements,
- › Instructs the practical approach that has enabled organisations to successfully navigate the complex landscape of hazardous environments.



Keynote Speaker | Marco Rahner

Sales Director | Siemens Pty Ltd

- › Commissioning Engineer and Project Manager for Substation Automation Projects. Technical Sales Consultant and Sales manager in headquarters responsible for the Cluster ASEAN and Pacific, Middle East and South Africa.
- › Experienced Siemens Energy Automation and Building Products product portfolio.
- › Specialist in Substation Automation, Power quality, and Distribution automation.
- › Drives the topics of Energy Efficiency, Smart buildings, Microgrids and Future grids including eMobility within Siemens for Southern and Eastern Africa.



What You Will Acquire From Attending:

- › **Insights and industry up-dates.** Key aspects of hydrogen will be explored, including production, storage, transportation, and usage. This shared knowledge will promote a deeper understanding of how to effectively and safely harness the potential of hydrogen technologies.
- › **An awareness of best practice.** The speakers will use case studies to demonstrate how hydrogen can be applied in a safe and sustainable manner despite inherent risks.
- › **The understanding of regulation and compliance.** The South African Standards and Codes of Practice will be covered and provide a sense of the regulatory landscape.
- › **Expertise sharing.** The experience of operators engaged in existing hydrogen projects will be shared.

Who Should Attend?

- › Instrumentation and Control Engineers
- › Engineering Managers
- › Process Plant Engineers and Technicians
- › Plant Managers and Project Managers
- › Process Maintenance Technicians
- › Risk Assessors
- › Chemical, Process and Mechanical Engineers
- › Instrumentation Technicians
- › Design Engineers
- › Manufacturers of Hazardous Areas Equipment
- › Safety Facilitators
- › Electrical Technicians and Managers
- › Process Control Specialists
- › Process Safety and Loss Prevention Managers
- › Government Safety Regulators/Inspectors
- › OHS/Training Managers
- › Tradies working in potentially explosive areas
- › Electrical and Instrumentation Trades, Technicians and all Engineering Professionals who have an interest in hydrogen and hazardous areas technologies and safety



Day One | Monday 4th December, 2023

8:15am **Registration Opens**

9:00am **Welcome Address**

9:15am **Session One | Keynote Presentation**

Reliable Hybrid Power Supply for Green Hydrogen Production and Related Safety Aspects

Marco Rahner: Sales Director, Siemens Pty Ltd



This presentation presents a comprehensive analysis of integrating green hydrogen technology into microgrids to achieve a reliable and sustainable power supply. Microgrids, being

localized power systems, are gaining increasing popularity due to their ability to enhance energy efficiency, promote renewable energy utilization, and improve grid resiliency. Discussing, the challenges that persist in terms of ensuring a continuous and stable power supply, especially when relying on intermittent renewable energy sources.

By utilizing excess renewable energy to generate hydrogen, microgrids can store energy for later use, overcoming the limitations of intermittency and improving overall grid stability.

It analyses the performance and impact of both, on-grid and off-grid solutions, including their ability to provide reliable power supply, enhance grid stability, and facilitate the integration of renewable energy sources. Examining operational safety measures in hydrogen production and how to combine the monitoring of reliability and safety in a seamless manner. Safety of gas monitoring, storage of hydrogen and the aspect of operational safety with continuous monitoring.

10:15am **Morning Tea**

10:45am **Session Two**

Renewable, Clean and Green Hydrogen Sources

Blen Teshome: Chief Operation Manager, APCON Enterprises Limited



Hydrogen can play a crucial role in supporting the transition to a de-carbonized global economy and can make a significant contribution to reducing global warming. However, like any gas, hydrogen safety must be ensured, and hydrogen must be handled carefully to minimize its potential risks. Hydrogen's unique properties present several key challenges for hydrogen safety handlers.

It is therefore essential to continuously improve safety regulations and standards for existing industries, in order to decarbonise our energy system.

This presentation covers the safety and hazardous aspects of hydrogen and addresses how safety can be utilized in the design, production, transportation, and storage of hydrogen full cycle.

11:30am **Session Three**

Case Studies – Hydrogen Safety Considerations in Projects Developed by Green Hydrogen Solutions

Ebrahim Takolia: CEO, Green Hydrogen Solutions



We delve into the latest advancements within our ongoing projects, meticulously outlining safety considerations throughout the entire hydrogen value chain. Our focus spans from the initial stages of electricity-to-hydrogen production, extending seamlessly into subsequent conversions into various fuels, whenever applicable.

12:15pm

Lunch

1:30pm

Session Four

Sasol's Solution Approach to Green Hydrogen Production

Nirasha Sewpersad: Senior Manager, Solutions, Sasol

Green H2 is identified as a key lever in achieving Sasol's strategic goals of decarbonization, and GHG reduction.

Sasol is a significant producer, user and marketer of grey hydrogen and our agnostic feedstock Fischer-Tropsch (FT) technology positions us ideally to be a green hydrogen major and to lead the development of South Africa's Green H2 economy, supported by South Africa's global competitive renewables endowments.

Delivering a sustainable and safe South African H2 economy is possible and the window of opportunity is now by focusing on catalytic projects that can create momentum and stimulate the creation of this industry.

The topic will share seeking a solution in our current asset transformation plan, the safety principles considered in the design, through safe handling and delivery of the final product to our customers.



2:15pm

Session Five

Fire Systems and Ensuring Safety in Hazardous Areas

Shantelle Alberts: Operations Manager, Integrated Fire Technology

The use of fire systems in hydrogen and hazardous areas is crucial for ensuring safety and minimizing the risks associated with these environments. The presentation will highlight the impact of fire systems in hydrogen and hazardous areas and the critical role that fire systems play in ensuring safety in these environments. For example, it may be necessary to use explosion-proof equipment and properly seal areas to prevent the spread of fire and smoke. Additionally, proper training and maintenance of fire systems are essential to ensure that they are functioning properly in the event of an emergency.



3:00pm

Afternoon Tea

3:30pm

Session Six

The Hydrogen Roadmap for South Africa: Best Practices for Mitigating Hazards and Risks

Dr Nelson Solan Chipangamate: Wits Mining Institute

The World Bank raised fears that the goal of universal access to sustainable energy by 2030 remains elusive, noting that in Sub-Saharan Africa, the number of people without electricity has increased in the past ten years. This is a red flag for South Africa, currently facing an energy crisis. Hydrogen has a huge promise to mitigate energy poverty in the country.

Sustainability and safety are major concerns. This paper explores a sustainable hydrogen roadmap for South Africa, highlighting innovative practices and technologies to mitigate risks and hazards. This is important for hydrogen to be adopted in the energy transition.



4:15pm - 5:15pm Networking Soirée

Day Two | Tuesday 5th December, 2023

9:00am Session Seven

Session Title TBC

Pieter Colyn: Head of Department Mine Occupational Health and Safety Department, *ENSAfrica*



10:00am Morning Tea

10:30am Session Eight | Masterclass Presentation

Hydrogen – The Practical Approach To Achieve Success (Product, Safety, and Compliance)

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



As the world transitions towards sustainable energy sources, hydrogen is touted as a viable option. However, ensuring the safe handling and compliance of hydrogen systems is paramount for its widespread adoption.

This masterclass focuses on a practical approach to addressing safety and compliance considerations associated with hydrogen.

We explore key aspects such as hydrogen creation, storage, transportation, and usage, highlighting best practices and industry standards.

Drawing on real-world examples, historical data, and case studies, we discuss risk mitigation strategies, safety protocols, and regulatory frameworks that enable the safe integration of hydrogen technologies.

Join us to gain valuable insights into harnessing hydrogen's potential while prioritizing safety and adhering to compliance requirements.

12:00pm Lunch

1:00pm Session Nine

xHACT Hazardous Area Classification – Hydrogen Installations

Schalk J.P. Kruger 3rd: Managing Director, *ExHACT - Expert Hazardous Area Consultation and Training (Pty) Ltd*



The increase in hydrogen installations prompted a review of the management of the hydrogen explosion prevention methodologies. This includes additional risks identified.

The differences in the typical hazardous area classification methodologies for hydrogen areas, their results, and additional risks must be understood for successful application.

1:45pm

Session Ten

IEC and IECEx in the Hydrogen Industry

Paul Meanwell: Manager - Engineering Governance, Komatsu Mining Corporation



Hydrogen is an abundant (most common element in the known universe) and energy-rich gas that occurs naturally in water and fossil fuels like natural gas, coal, and petroleum, and can be used as a fuel by separating it from these sources.

Hydrogen is also highly explosive and will burn/explode with a concentration in the general atmosphere of anywhere between 4 and 74%, which also makes it quite a dangerous gas to handle and use.

The IEC (International Electrotechnical Commission) standards for Explosive Atmospheres have for many years covered hydrogen gas in its 60079 series of standards and in general, the industry is well versed in the dangers of hydrogen and its use. Now with the proliferation of hydrogen vehicles and fuelling stations in many parts of the world, the general public is being exposed to the gas more and more, and they know little about the dangerous properties of hydrogen.

The IECEx Conformity Assessment System that certifies components and assemblies used in the hydrogen industry has formed Working Group 19 to deal with hydrogen more at the assembly level and has teamed up with the ISO Technical Committee TC197 to better define the safety testing requirements for fuel dispensers, and has released an Operational Document (OD) to deal with this.

2:30pm

Afternoon Tea

3:15pm

Q&A Session

This is an opportunity for delegates to seek clarification and gain a comprehensive understanding of the content shared by the speakers. Delegates gain insight into real-world scenarios and applications. We encourage dialogue, discourse and diverse viewpoints. We encourage a platform for an authentic well-rounded interactive learning experience.



4:15pm

Conference Close

General Information

Conference Venue & Accommodation

CedarWoods of Sandton
120 Western Service Road
Woodmead, Johannesburg

+27 (0)11 804 3777

www.cedarwoods.co.za

Food and Beverages

All lunches, and morning and afternoon refreshments are part of your delegate registration. The networking soiree is also included.



Tickets & Registration



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