



## Reflections and Lessons Learnt From the 17th International Ferroalloys Congress (INFACON XVII)



The 17th edition of the International Ferroalloys Congress (INFACON XVII), jointly organized and hosted by the University of Science and Technology Beijing (USTB), Chinese Society for Metals, and the China Ferroalloy Industry Association, took place from 18 to 22 September 2024 in Beijing, People's Republic of China. The INFACON series, often dubbed the 'Olympics of Ferroalloy Research', is held once every three years, and provides a platform for the global ferroalloys industry to meet and showcase knowledge and technologies driving the industry. The congress series is organized by the International Committee on Ferroalloys (ICFA) and is supported by a team of dedicated international experts representing industry, applied research,

and academia. The conference papers published as part of the congress proceedings contribute to a rich and authoritative peer-reviewed body of knowledge in fundamental and applied ferroalloys research. This year's congress comprised a variety of topics designed to address industry challenges and was centred around strategic themes such as:

- Fundamental knowledge and basic theory of ferroalloys production (e.g. thermodynamics, thermochemistry and process challenges).
- Climate change, environmental, sustainability, and social licence to operate, addressing the drive to decarbonization, climate neutrality and green transition (e.g. hydrogen/ hydrogen plasma reduction, use of biocarbons and other non-fossil reductants, carbon capture and utilization, and the like).
- Intelligent systems, incorporating computational modelling, automation, process control, and machine learning.
- Productivity and competitiveness (e.g. ability to utilize low grade ores and fines, stable furnace operation, prereduction, preheating, recycling and recovery of by-products, energy utilization and recovery).
- Markets and competitiveness, focusing on demand and supply, including in-depth analysis of growth drivers.
- Product quality control and its impact on downstream stainless steel production.
- Key technological and operational issues highlighted through case studies (e.g. slag properties, electrical controls, tap hole design, and optimized furnace operation).

The history of the INFACON series is especially fascinating and uniquely important to South Africa. The first edition, jointly organized by SAIMM, Mintek (formerly the National Institute of Metallurgy) and the Ferroalloys Producers' Association (FAPA), was held in Johannesburg, South Africa in 1974. The chairperson of the first INFACON was none other than Dr R.E. 'Robbie' Robinson (1929-2016, MHDSRIP). Dr Robinson was the President of SAIMM (1975-1976), Director of the (South African) Government Metallurgical Laboratory (GML) from 1961-1966, and Director General of the National Institute for Metallurgy (NIM) from 1966-1976. During this period, Dr Robinson was also instrumental in initiating university research group schemes involving the various university departments and Mintek. This year's INFACON XVII edition marked the 50th anniversary of the conference series and it is by no coincidence that the conference was chaired by Prof. Rodney Trevor Jones, whose career and rich contribution to ferroalloys research is unparalleled globally. Ironically, Prof. Jones is a Past President of the SAIMM (2015-2016), an avid academic, a well respected mentor, and advisor in the industry. It is also important to note that, courtesy of the industry giants, South Africa, through Mintek, provides permanent secretariat to the international committee that arranges the INFACON events.

## President's Corner *(continued)*

The INFACON XVII provided a nostalgic moment to reflect on both the demise and future of the ferroalloys industry in South Africa. The timing of the congress coincided with a period associated with fluctuations in the global prices of ferroalloys, leading to a decline in economic viability and competitiveness of most producers, including those in South Africa. Despite the availability of ores and long-term favourable international market conditions for stainless steel (with a compound annual growth rate of 5.3% since 1980), one would expect the installed capacity and capacity utilization of the South African ferroalloys producers to grow in line with the growth in the global stainless-steel market. However, the South African bulk ferroalloys industry gradually lost global competitiveness due to several factors, including the poor availability and increasing cost of electricity, ageing technologies, and a significant increase in the pricing of premium ores. These factors, among several others, have contributed to the precipitous decline of the ferroalloys industry in the past decade, resulting in the closure and mothballing of numerous smelters. The export of unbeneficiated raw ores, precipitated by the growth in demand from China, resulted in the emergence of a thriving export industry for raw or unbeneficiated ores at the demise of local value addition and beneficiation. To South Africa and the region, the 17th edition of the International Ferroalloys Congress thus coincides with the emergence of robust debate on how to revive and resuscitate the ferroalloys industry. The current state of the ferroalloys industry invariably presents both challenges and opportunities.

The vibrant discussions during the course of INFACON XVII were extremely fulfilling but naturally raised a number of open questions:

- Was China's growth in the ferroalloys a result of deliberate investment in state-of-the-art technologies or simply state support as often alluded to in international media?
- Was the growth in Chinese ferroalloys production at the demise of the South African industry despite the former relying on imported ores from South Africa?
- What can the South African ferroalloys industry learn from their Chinese counterparts? Would the industry players from both sides be open to participating in jointly funded collaboration projects and programmes?
- Would a joint South Africa-China dialogue on ferroalloys research be a feasible vehicle to share knowledge, ideas, and technical expertise?
- Industry stoics, such as Prof. Robbie Robinson, were strong believers in collaborative research involving industry, academia, research councils, and other stakeholders. Would the conception and implementation of strategic research programmes help to alleviate the further demise of the local ferroalloys industry?
- Given the fragmentation of the local ferroalloys industry, is it a far-fetched dream to think of resuscitating Professor Robinson's thinking and strategy towards building and sustaining scientific expertise in the industry?
- What role can research and industry organizations, such as Mintek and Ferro Alloy Producers Association (FAPA), respectively, play in developing a long-term research and development strategy leading to the revival of the ferroalloys industry in South Africa?

Obviously, these open-ended questions are not conclusive but are meant to stimulate debate and new thinking that could result in the revival of the local ferroalloys industry. The various INFACON editions provide a knowledge exchange platform and mechanism through which bilateral and multilateral collaborations are developed and sustained with the goal of developing and deepening human capital capabilities for South Africa. The collaboration and partnerships with international research institutions and industry also ensure that fit-for-purpose technologies and flowsheets are developed, leading to localization and adoption of global technologies in the local industry.

The next INFACON takes place in the scenic city of Reykjavik in Iceland in June/July 2027.

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