Report of the 3rd Industry Think Tank proceedings

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On 13 March 2013 the 3rd Annual Industry Think Tank session for the foundry industry was held at Kwa Maritane Bush Lodge in the North West province of South Africa as part of the official programme of the first Metal Casting Conference held in the country. The Industry Think Tank was strategically programmed to follow the 3rd BRICS Foundry Forum session and preceded the Metal Casting Conference. The conference was co-hosted by the National Foundry Technology Network (NFTN), the South African Institute of Foundrymen (SAIF) and the University of Johannesburg's Metal Casting Technology Station (UJ MCTS). The event was attended by selected participants of the BRICS Foundry Forum and invited representatives of the South African foundry industry. The think tank was attended by 20 international participants, international and local media, senior government officials, academics, industry associations and foundry practitioners.

The purpose of the 3rd Industry Think Tank was to share ideas on how the South African foundry sector could better position itself in a changing world market. The session was designed to not only enable dialogue between foundries and their supporters and international peers, but also to foster networking and information exchange between individuals.

The moderators used a World Café moderation method, where structured questions were used to stimulate conversations. At each table, a host had to make sure that the key insights were recorded directly onto paper tablecloths to make sure that all participants could see their contributions recorded.

Three discussion questions were used, and after each question participants had to change tables while the hosts remained at the table.

This approach unlocked interesting dynamics where "global" issues and red threads emerged, despite the different compositions of the tables after each round of random change of participants. The moderators captured the key insights visually during the wrap-up.

The three key questions discussed during the Think Tank were:

- Round 1: What is changing in the foundry industry and how?
- Round 2: How do these changes affect us and how are we responding?
- Round 3: What are the most important opportunities for collaboration and cooperation?

The rest of this document will capture the key points recorded by the hosts during the dialogue at the tables and should not be seen as a publication written by the facilitator.

Round 1: What is changing in the foundry industry and how?

All the BRICS countries are experiencing an increased awareness of the importance of domestic support for foundries. Governments are pursuing localisation strategies. The population growth in the developing world is driving domestic demand in sectors like construction, transport and industry.

With the increased demands on foundries created by increased global competition, stricter environmental standards, shorter product life cycles, lower tariffs and better global transport networks, the need for centralised or public research and development in the foundry industry is increasing. Very few foundries can by themselves fund the R & D that is needed to adapt to the changing business environment.

There are new markets emerging in industrial and chemical sectors like oil, gas, infrastructure projects and specialised steels. Large infrastructure projects such as the Worldcup (2010 & 2014) and the Olympic stadium are requiring castings from BRICS countries. Growth in emerging economies in the developing world is driving domestic growth and exports.

In the automotive sector there is an increased shift to Alumunium for engine blocks, seat frames and even body parts. Mass transit and the modernisation and expansion of transport networks are increasing the demand on castings, while at the same time better transport networks makes it easier for competitive products to enter traditional markets. In hybrid and electrical vehicles, lighter materials and even new materials are required, with magnesium and aluminium being important elements. New metal types are also used in these markets, providing foundries that can experiment or enter new metal markets an important niche advantage. Alternative energy has high potential with wind turbines being a good example of a new market.

Across all the BRICS countries mining is seen as an important growth sector and a niche market with sophisticated demands that gives BRICS countries a competitive advantage. As the global demand for raw materials increase, mines are getting deeper, driving demand for larger and more sophisticated castings in a variety of applications. As costs are rising rapidly and awareness of safety and environmental control is increasing, more foundries are considering mechanisation.

There are also increasing risks of input material shortage leading to increased input costs. Shale fracking and the growth in the construction sector means sand prices are increasing, but at the same time drive the demand for castings used in oil extraction.

New technologies developed in other industries are being adapted to the foundry industry. For instance, 3D printing (additive manufacturing) is threatening traditional pattern making by offering a faster and more accurate pattern and mould development cycle, while new nano materials and metals are entering traditional casting markets. In many instances composite materials and plastics continue to make inroads into markets traditionally served by metal castings. At the same time, better flow simulation and casting technologies allow castings to make inroads into machining and fabrication markets.

Round 2: How do these changes affect us and how are we responding?

In many newer markets the volumes are low and the sophistication of demand is increasing. This is attractive for jobbers and at the same time it is difficult for production foundries to be competitive. In many high volume markets (like automotives) the manufacturing is continuously shifting to the lowest cost producers. This is further exacerbated by global single sourcing strategies that are increasingly used in mass products, automotives and to some extent industrial products.

In several countries foundries are exploring ways of recycling heat due to rapidly increasing energy costs.

Foundries that are able to invest in new technology, processes and material types are able to capture niche markets. The younger generation of foundry practitioners are also skilled differently and more likely to be attracted to more modern foundries. Generally South African foundries are not investing enough in more cost efficient equipment, training workers and up-skilling the work force.

There is increased pressure to bring down the weight of castings by improving pattern designs to deliver near net-shape castings, resulting in lower machining cost. This is made possible by flow simulation technology, robotic (CNC) based pattern making and better sand management. Additive manufacturing is also making inroads into prototyping and pattern making.

Globally environmental, health, safety and labour standards are becoming stricter and have a direct impact on foundry costs. Foundries have to become much more energy efficient and have to better understand their impact on the environment. For some markets this environmental dimension is valuable, while for many this means increased costs..

In South Africa finance for expansion is expensive and complicated to secure. Government incentives like the Manufacturing Competitiveness Enhancement Programme (MCEP) of the Department of Trade and Industry (the dti) is still not well known in the foundry industry.

Round 3: What are the most important opportunities for collaboration and cooperation?

The greatest opportunity for South Africa is the supply development and localisation drive, with government and state-owned enterprises committing to local content. The results of the BRICS study should be used to lobby the government to level the playing field for South African foundries. While increased localisation pressure on public procurement is a good start, attention must also be directed towards localising key inputs and suppliers of technology, and securing licensing and partnership agreements with key technology owners.

The NFTN through its network of partners have brought together foundry practitioners and their representatives, public support institutions and the academia. Industry should use this platform to engage constructively with academia and public research organisations to develop, apply and

transfer appropriate technology that assists South African foundries to catch up and increase their competitiveness. Engagement with the academia is important because better research data is needed. Skills development must also be institutionalised. Academia and support institutions should exchange experiences between BRICS countries and other developmental partners.

Foundries have to improve the visibility and the perception of foundries in order to attract financial investment and to attract young talent.

Organisations such as the BRICS foundry forum highlights the differences in public support and the unevenness of the playing fields and this initiative should continue to receive support from BRICS and member states.

Foundries have to continuously strive to drive down costs, while at the same time improving yields, productivity and output. One way of doing this is to increase the lobbying and advocacy of industry associations to negotiate better input costing. There is a need for stronger buy-in from foundries in a modernisation programme. This is not only about better technology and process, but also about management of the foundry as a business, and management of relationships with customers.

Lastly, foundries also have to consider new markets that will substitute existing technologies in the next 10 to 20 years. For instance, alternative energy both in electricity generation and in the automotive sector will create completely new markets. Only modern foundries that are exploring these new markets, investing in new materials and technologies will be in a position to exploit these new opportunities.

In closing

The dialogue in a Think Tank depends largely on the context and the levels of trust between the participants. The table hosts that were identified by the attendees were trusted to facilitate and moderate a discussion. While some South Africans expressed concern before the event about having potential competitors in the room and part of the conversation, the feedback after the event was that the international perspective enriched the dialogue and in many cases gave increased importance to many issues such as increasing productivity and increasing the use of technology in foundries.

The event was well attended by foundry practitioners from South Africa, and the scheduling of the Think Tank as part of the conference programme made it possible to draw in a much broader industry participation than ever before. The fact that many participants in the Think Tank have participated in previous events of this nature made the dialogue easier to moderate and to record.

Now the co-hosts must take the issues raised further into their respective work programmes to ensure that industry continues to engage in these workshops. Our common risk is that dialogue gets labelled as “talk shops” and we have to ensure that the participants see that their ideas, concerns and contributions shape not only programmes and projects, but institutional policies.