Quarter 4 and Annual Report of 2020/21

Prepared by:

National Foundry Technology Network (NFTN)
PO Box 395, Pretoria, 0001

Prepared for:

The Department of Trade, Industry & Competition (the dtic)
Private Bag X84, Pretoria, 0001

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Contents

List of Acronyms

AEL	Air Emissions License
CSIR	Council for Scientific and Industrial Research
DEFF	Department of Environment, Forestry and Fisheries
EMCO	Executive Management Committee
GFTC	Gauteng Foundry Training Centre
NFTN	National Foundry Technology Network
OEMs	Original Equipment Manufacturers
PED	Pressure Equipment Directive
QMS	Quality Management Systems
the dtic	Department of Trade, Industry and Competition

EXECUTIVE SUMMARY

The 2020/21 financial year has been a challenging year for the industry as a whole following the COVID-19 pandemic and resulting lock-down, that has led to many companies, and manufacturers in particular being negatively affected. The foundry industry was not spared of this challenge, but fortunately many have met the challenge and continued production in this unprecedented situation.

In terms of the NFTN, work continued, although it was different and challenging operating in the 2020 lockdown. However, good progress has been made in various fronts, including wrapping up of projects underway, positive stakeholder engagement and a growing media presence.

The long-awaited expression of interest (EOI) process to create a shortlist of preferred service providers was implemented fully during this fiscal year and has proved highly successful in reducing procurement turnaround times. After its implementation, the NFTN successfully contracted seven capacity-building projects that was completed this financial year and has yielded long-term contracts between the foundry and automotive OEMs. This was a great milestone achieved towards supporting the local foundries to supply into OEMs and aligning the foundry industry to respond to the Government's Economic Reconstruction and Recovery Plan key intervention that is "massive increase in local production".

The environmental study commissioned by the NFTN to understand the level of environmental compliance of the foundry sub-sector is completed. The study revealed 134 foundries nationwide with majority located in Gauteng province.

Despite the effects of COVID-19, there has been progress all round. However, the current NFTN MOA is nearing an end and **the dtic** needs to advise on the way forward as this is now affecting the support interventions in pipeline to the foundry industry. **the dtic** has advised at EMCO that there may not be any new projects implemented until they advise otherwise.

Achievement Highlights 2020/21

The NFTN continued to carry its mandate to support the foundry industry. The EMCO recommended that the NFTN in this fiscal year must focus on completing the projects that overlapped from the previous year.

Firm level interventions

- Eight (8) foundries namely Boscpick, Dinky Manufacturing, Elmacst, High Duty Castings, PDC, Halcast, Prevail and Autocast were supported this current financial year. Prevail Engineering secured four contracts for the next seven years.
- QMS implementation stage was completed at the following foundries (Cyclops and Viking). At Nicast the implementation stage was halted at the last phase due the foundry's closure.
- IATF implementation at Prevail foundry is completed awaiting certification.
- PED implementation stage at Yellow Star is now completed and the next phase is certification.
- Duvha and Cyclops have completed their S24G process and submitted their application to their respective municipalities for rectification.

Industry level Intervention

- Environmental study to evaluate the level of compliance and performance improvement of the foundry industry is now complete. The study revealed the number of foundries and their locations in the country in relation to the declared air quality high priority areas, the total tonnage produced and metal types produced. This information is crucial for the DEFF to make informed decision when reviewing the AEL policy. The NFTN in conjunction with industry associations will be engaging the DEFF in this matter going forward.
- The NFTN 10 year impact study of the NFTN is ongoing in the final stage awaiting the PSC for final review.

Transnet Engineering (TE) R&D Division and NFTN are embarking on a collaboration to increase the list of local manufacturers for cast rail components (Side frames, bogie bolster and couplers). Key strategic components have been identified by TE that needs to be manufactured locally to ensure security of supply. The NFTN will be play a pivotal role in supporting both the TE and the development of the local suppliers for rail components.

After a meeting with Limpopo Department: Economic Development, Environment and Tourism (LEDET) the NFTN has presented a proposal to support rural foundries to grow to a more advanced level with improved efficiency and utilizing renewable energy. The NFTN is awaiting feedback from the LEDET.

1 FOUNDRY CAPACITY BUILDING

The support provided under the foundry capacity building programme focuses on the provision of assistance with productivity and efficiency improvement in foundries at plant level, as well as the provision of support for the localisation of manufactured products.

Product and tooling development

The interventions in eight (8) foundries below were successfully completed in the 2020/21 financial year. The impact of the interventions were not yet realised in some foundries so far, however, Prevail Engineering secured a long-term contracts to supply into the automotive OEMs through Bosch.

Foundry	Nature of project	OEM / foundry client
1. Boschpick Engineering, KZN	Wheel Drive Housing - drive system used for railway and underground mining cars.	Joy Mining Equipment
2. Dinky Manufacturing, Eastern Cape (SMME, Aluminium Die Casting, jobbing foundry located in Berlin, East London with about 30 employees)	EIQ lightning base - water resistant control box used for security on equipment in mines.	Centurion Security Solutions
3. Elmacast, Gauteng	Truck 5th wheel for transport/ automotive, expansion to tap into truck market	JOST South Africa
4. High Duty Casting, Gauteng	Pressure plates for vehicles	Schaeffler Group
5. Pressure Die Castings, KZN	Alternator Bracket: aluminium components used for general engineering and automotive industry for engine assembly.	Ford South Africa
6. Autocast, PE	Brake Calliper Body for Ford Ranger (Manufacturing of Prototype Cavity Pattern Plate and Core Boxes)	Ford South Africa
7. Halcast	Design, Modification, Simulation and Manufacture of Die project - Lock sets Design for RSI Smart Canopies and Tooling Support	RSI Canopies
8. Prevail, Gauteng	Upgrading of High Pressure Die Casting Machinery to Latest Technology for Shot Monitoring & Tooling	Isuzu,MBSA Nissan, and FordSA

The outcome of the interventions are follows:

1. **AUTOCAST, PE:** Brake Calliper Body for Ford Ranger (Manufacturing of Prototype Cavity Pattern Plate and Core Boxes) is completed, all the tooling have been manufactured and ready for production trials on AutoCast's automated Greensand moulding and casting line. AutoCast completed the manufacturing of the tooling for both sand moulding and the core blowing. The manufactuing of the tooling was completed ahead of schedule awaiting outcome from the OEM.

2. **HALCAST:** Design, Modification, Simulation and Manufacture of Die project - Lock sets Design for RSI Smart Canopies and Tooling Support is completed. The design of two cast components (castings) as well as the dies (tooling) to cast these two components are completed. In addition, these dies must be manufactured to validate the design. The outcome of this intervention will see the foundry supplying into the container industry for cryogenic conditions.

3. **PREVAIL:** Upgrading of High Pressure Die Casting Machinery to Latest Technology for Shot Monitoring & Tooling. The last phase which is monitoring and training, the process handover and onsite inspection were completed.

   Four Shot Monitoring Units [SMU] have been installed and commissioned at the Prevail foundry. Five Prevail staff members are actively using the SMUs part of technology transfer to:

   - Record their production,
   - Implement a traceability system for their casting machine's injection profiles,
   - Determine if a castings has been made within tolerance process parameters,
   - Improve productivity and quality of products,
   - Trouble-shoot and investigate machine's injection and determine faults,
   - Easily set machine's to the centre of the process window, store critical information

   The second part of the project "Die Improvements", contributed to the production of sound castings and enhanced product quality and productivity. This intervention has led to the foundry securing seven years contracts to the automotive OEMs.

2 TECHNICAL AND REGULATORY SUPPORT TO INDUSTRY

This intervention entails facilitating collaboration with relevant institutions and government support programmes to offer sound technical and regulatory support to industry through provision of assistance with environmental compliance interventions and accreditation measures.

2.1.1 QMS Implementation

The ISO 9001:2015 QMS Implementation stage intervention were supported in three foundries (Cyclops, Nicast and Viking). Two of the foundries Cyclops and Viking were successfully completed and ready for certification. Nicast could not be completed due to closure.

IATF 16949

The IATF 16949 certification is an international recognised quality standards for an automotive industry. The purpose of the IATF 16949 is to provide the organisation with the framework for continual improvement, promote reduction of variation and waste in the supply chain and emphasis in defect prevention. Benefits of IATF 16949 certification includes the following:

- Consistent products and services
- Customer satisfaction and repeat business
- Improved chances of winning new business where IATF 16949 is required
- Greater efficiency and productivity and
- Increased focus on risk management

The implementation stage of the IATF 16949 certification at Prevail is completed and the foundry is now in progress to move to certification stage.

2.1.2 QMS Certification

Olde World: The ISO 9001:2015 certification stage was terminated due to challenges beyond the control of the NFTN.

Southern Cross received the water use licence from DESTEA DWS (Department of Water and Sanitation). The foundry has not made progress about the certification stage and still awaits a decision on the AEL and environmental authorisation. The project is terminated due to the foundry not being able to verify material grade.

2.1.3 PED Implementation

Pressure Equipment Directive (PED) is an EU directive which sets out the standards for the design and fabrication of pressure equipment. This compliance will allow the foundries the opportunity to compete in the oil and gas markets, where such products are typically imported. The foundries who are PED approved will be able to produce the castings with CE- stamping, this will enable them to supply into OEMs where the stamping is a requirement.

The PED implementation stage in Yellow star is completed and ready for certification stage. However, the foundry will not be able to go through the certification stage due to no technical data.

2.1.4 AEL Facilitation

AEL facilitation was enrolled at both Cyclops and Duvha to avert foundry closure due to non-compliance to the AEL. Both foundries have completed the S24G rectification process and submitted the application with the respective municipalities and awaits final decision on the AEL and environmental authorisation.

3 SKILLS DEVELOPMENT

The NFTN in collaboration with tertiary institutions and other industry stakeholders is supporting the interventions to develop the artisans in core foundry skills to sustain this industry.

3.1.1 GFTC

The year 2 in Pattern making and Moulding for 33 students enrolled last year is ongoing at GFTC and 1 student dropped out and got employed. Total students remaining are now 32.

4 STAKEHOLDER RELATIONS, COMMUNICATION AND AWARENESS RAISING

4.1.1 Stakeholder Relations

Collaboration with the Innovation Hub management company (TIHMC) is ongoing to identify service providers to implement the use of spent foundry sand for construction purposes. In this financial year the innovation hub contributed R700 000.00 to the project. Key projects to be implemented are as follows:

- Concrete ballast for railway lines,
- Precast markers for piping and telecommunication,
- Concrete manhole covers for local municipalities and
- Bricks for housing.

NFTN 10-year impact assessment project is in progress in its final stage. Feedback was received from the service provider after the last meeting where the service provider requested an opportunity to rectify gaps identified by the CSIR. The appointed PSC is reviewing the report, and will share the outcome on completion.

4.1.2 Strategic Projects

ENVIRONMENTAL COMPLIANCE AND PERFORMANCE IMPROVEMENT FOR THE FOUNDRY INDUSTRY IN SOUTH AFRICA

The environmental study commissioned by the NFTN to understand the level of environmental compliance of the foundry sub-sector is completed. The study revealed the information below;

- **Number of Foundries**: The National Foundry Database was revised to a total of 134 foundries. However, of these, only 123 foundries are operational as at June 2020, if the foundries that have closed down or are in the process of closing down are excluded from the database. However, it must be re-iterated that of this number, the project team was not able to contact or receive any feedback from eight foundries, hence it cannot be verified if these are actually foundries or not.

- **Geographic Distribution of Foundries**: The majority of the 134 foundries are located in Gauteng (92); followed by KwaZulu-Natal (17); Western Cape (11); Free State (5); Eastern Cape (4); Northern Cape (3); and North-West (1) and Mpumalanga (1).

- **Types of Foundries – Ferrous and Non-Ferrous**: The majority of foundries were found to be ferrous foundries (47 %), with a good representation of non-ferrous foundries (32 %). Some foundries were found to have both ferrous and non-ferrous operations (21 %).

- **Classification of Foundries – Jobbing and Production**: Many of the foundries are classified as both Jobbing and Production (44 %); followed by Production (42 %) and lastly jobbing (33 %).

- **Primary Moulding Process**: The majority of foundries use a Sand Casting process (82 %), followed by Gravity Die Casting (15 %); High Pressure Die Casting (7 %); Investment Castings (7 %); and Low Pressure Die Casting (5 %). Types of Furnaces: Electrical induction furnaces which vary in size from 0.05 tonnes to 46 tonnes are used by approximately 75 % of foundries. Other furnaces used include crucible (29 %), combustion-based Heavy Fuel Oil or Natural Gas (14 %) and Electric Arc Furnaces (9%).

- **Feedstock Used**: The types of feedstock considered include virgin metals, raw scrap metals, and cleaned scrap metals. The total distribution of feedstock between the various types are very similar, i.e. 32 foundries (58 %) use virgin metals; 31 foundries (56 %) use raw scrap metals; and 32 foundries (58 %) use cleaned scrap metals.

- **Average Tonnage Produced**: The metal type with the highest tonnage produced for the foundries that disclosed specific tonnage related to metal types was iron in all its variations including Grey Iron and Cast Iron.

- **Export Potential**: A total of 25 foundries (48 % of respondents on this question) have indicated that they do export and 27 foundries (52 % of respondents) indicated that they do not export. The geographical distribution of the foundries that do export does not illustrate any new trends, as the majority of the foundries in South Africa are based in Gauteng. The percentage of product begin exported by the foundries range from 0.5 % to 100 %.

- **Annual Turnover**: The majority of the foundries show that their turnover is more than R 10 million (77 %), followed by R 5 million to R 10 million (9 %), R1.1 million to R3 million (8 %), and R3.1 million to R5 million (6 %) and then less than R1 million (2%).

- **Employment Status**: The estimated current number of male and female employees in the foundry industry is 5 465, of which 89 % are male and 11 % are female. The majority of staff are employed on a permanent basis (95%) with very few instances where foundries make use of temporary labour (5%). The total number of permanent employees equates to 4 445. If this data is extrapolated to the 123 currently operational foundries in South Africa, the total number of employees in these 123 foundries is in the order of 11 390. This extrapolation is an estimate and it is based on 48 surveys that provided feedback to this aspect, out of a sample size of 57 surveys received.

The information above revealed by the study will be shared with the DEFF as a supporting evidence of the current landscape of the foundry industry to support for the relaxation of the existing policy of AEL in the foundry industry.

4.1.3 Communication and Awareness-Raising

The NFTN Communication strategy and action plan was approved by EMCO and significant strides were made in re-establishing the NFTN in the public eye, despite the setbacks of the COVID-19 lockdown.

Events

The NFTN participated in two industry events and hosted one event during the year. It is now a well-established practice that events are hosted online. Virtual events are proving a very different experience and product to live events, with some advantages, and some disadvantages when compared to the "real thing". However, the NFTN had a virtual exhibition at both Africa Rail and the Manufacturing Indaba, both of which included delegate participation.

- **Africa Rail**
  The NFTN had a virtual exhibition stand at the virtual Africa Rail 2020, on 19 and 20 October. The NFTN team attended and were able to virtually network.
- **Manufacturing Indaba 2020**
  The NFTN hosted a virtual exhibition stand at the Manufacturing Indaba, which showcased the newly developed NFTN corporate video.
- **NFTN Environmental Survey Workshop**
  The NFTN hosted a virtual workshop / webinar on 3 November 2020. The event was attended by over 60 delegates from the foundry sector. The purpose of the event was to provide feedback to the sector on the environmental compliance survey undertaken by the CSIR, but the workshop was also viewed by the sector as a good first step in re-engaging on many issues. Feedback was positive and there was some good discussion. A full recording of the session is available at the following link: https://attendee.gotowebinar.com/recording/3393646348388626448

Tools and Website

- A new site has been designed at www.nftn.co.za
- An NFTN YouTube channel was set up and all NFTN videos were posted to the channel.

- A new NFTN corporate video was produced in November 2020. The video is visible on the home page of the NFTN website.

Media Engagement

One of the main areas of success for the communication efforts was the increase in media coverage and the renewal of a relationship with key industry media. A total of nine adverts were placed:

- Six in Castings SA (one per edition for 12 months)
- One advert in Engineering News
- Two adverts in MechChem Africa

Media articles carried were as follows:

	Date	Publication	Headline / topic	Source
1.	1 June 2020	Castings SA	Three South African foundries accredited with PED 2014/68/EU certification standard	Print (and eMagazine due to lockdown)
2.	1 June 2020	Castings SA Online	As above	http://castingssa.com/three-south-african-foundries-accredited-with-ped-2014-68-eu-certification-standard-which-enables-them-to-supply-castings-with-internationally-recognised-ce-marking/
3.	1 July 2020	MetalWorking News	Three South African foundries accredited with PED 2014/68/EU certification standard	Print
4.	25 June 2020	MetalWorking News Online	As above	http://metalworkingnews.info/three-south-african-foundries-accredited-with-ped-2014-68-eu-certification-standard-which-enables-them-to-supply-castings-with-internationally-recognised-ce-marking/
5.	8 August 2020	Castings SA	NFTN supports Gauteng Foundry Training Centre	Print
6.	August 2020	Castings SA online	As above	http://castingssa.com/nftn-supports-gauteng-foundry-training-centre/
7.	01 October 2020	CastingsSA	Industry study shines a light on the challenges facing foundries	Print
8.	October 2020	Castings SA online	As above	Industry study shines a light on the challenges facing foundries | (castingssa.com)
9.	06 November 2020	Engineering News	Industry body promotes support interventions for local foundries	Print (this was also shared on LinkedIn, view here: (20) Post | Feed | LinkedIn
10.	06 November 2020	Engineering News Online	As above	https://www.engineeringnews.co.za/print-version/support-interventions-provided-for-local-foundries-2020-10-22
11.	20 November 2020	Research Channel	As above	Online via subscription

	Date	Publication	Headline / topic	Source
12.	01 December 2020	Casting SA	NFTN webinar reveals shortfalls in South African foundry industry	Print
13.	December 2020	Castings SA online	As above	NFTN webinar reveals shortfalls in South African foundry industry | (castingssa.com)
14.	01 November 2020	Sunday Times	The Innovation Hub	Print
15.	23 January 2021	Crown Online - MechChem Africa	The NFTN: supporting localisation and growth	The NFTN: supporting localisation and growth (crown.co.za)
16.	23 January 2021	MechChem Africa	As above	Print
17.	18 March 2021	Crown Online - MechChem Africa	NFTN intervention helps lift SA foundry to global standards	https://www.crown.co.za/latest-news/mechchem-africa-latest-news/15861-nftn-intervention-helps-lift-sa-foundry-to-global-standards
18.	18 March 2021	MechChem Africa	As above	Print