CMC Fires Up Texas One and Brings EAF Performance to the Next Level





In May 2020, CMC and Badische Stahl-Engineering (BSE) collaborated once more to upgrade the 123-ton* AC-electric arc furnace (EAF) in Seguin, Texas, USA. The primary goal of this significant upgrade was to enhance reliability and productivity. BSE customized key technologies for CMC Steel Texas, including a 21% increase in shell volume through gantry design. This upgrade aimed to reduce scrap leveling and provide greater flexibility in charge mixes. The project included a new EAF shell, tilt platform, electrode arms with slide-bearing gantry, transformer delta closure, MultiROB and a hydraulic system. This article details the engineering of components using the finite network method and 3D component modeling, as well as the project management challenges encountered during this multiyear endeavor.

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Introduction

Located deep in south Texas, CMC Steel Texas is the largest American mini-mill operated by CMC. Established in 1947 as CMC's first mini-mill, the site originally functioned as a rail rerolling mill producing rebar. Over the years, through continuous technological advancements, safety initiatives and equipment upgrades, CMC Steel Texas has evolved into a state-of-the-art mini-mill. Today, it produces and ships rebar, angles, channels, billets and other long products worldwide. The facility's annual production includes approximately 600,000 tons of shredded ferrous scrap, 1,000,000 tons of melted steel and 800,000 tons of rolled long products.

At the heart of CMC Steel Texas is the EAF. The current EAF, commissioned in February 2023 and aptly named "Texas One," symbolizes the extensive collaboration and effort from multiple CMC departments, third-party original equipment manufacturers (OEMs), and contractors involved in its research, design, planning and construction. Texas One is a 123-ton tap furnace featuring a tilt platform, refractory-lined lower shell, water-cooled panel upper shell and roof, slide-bearing cone-style gantry, and three copper electrode arms. It is charge bucket–fed, utilizes multiple oxy-fuel burners and is powered by a 105-MVA Tamini transformer.

For years, the meltshop at CMC Steel Texas has led the steel industry in various key performance indicators (KPIs). However, by 2018, with its aging EAF known as "F furnace," CMC began exploring potential improvements to further enhance their processes and maintain their world-class status. This article will discuss the decision-making process behind revamping the meltshop with a new EAF, the selection of the best furnace designer for the project, the challenges and opportunities encountered during the project, and the future prospects for maximizing this generational investment.

After collaborating closely with Badische Stahl-Engineering (BSE) on the designs for several years and safely navigating a meticulously planned nearly two-month outage, CMC Steel Texas' meltshop successfully improved its KPIs and other key elements, as highlighted in Table 1. Fig. 1 shows a picture of the Texas One EAF

*Note: All references to "tons" in this article refer to short tons.

shortly after hot commissioning. The details of how these improvements were achieved will be presented throughout this article.

Project Motivation

History

Commissioned in February 2007, the F furnace enjoyed a highly successful campaign spanning nearly 16 years.

Table 1

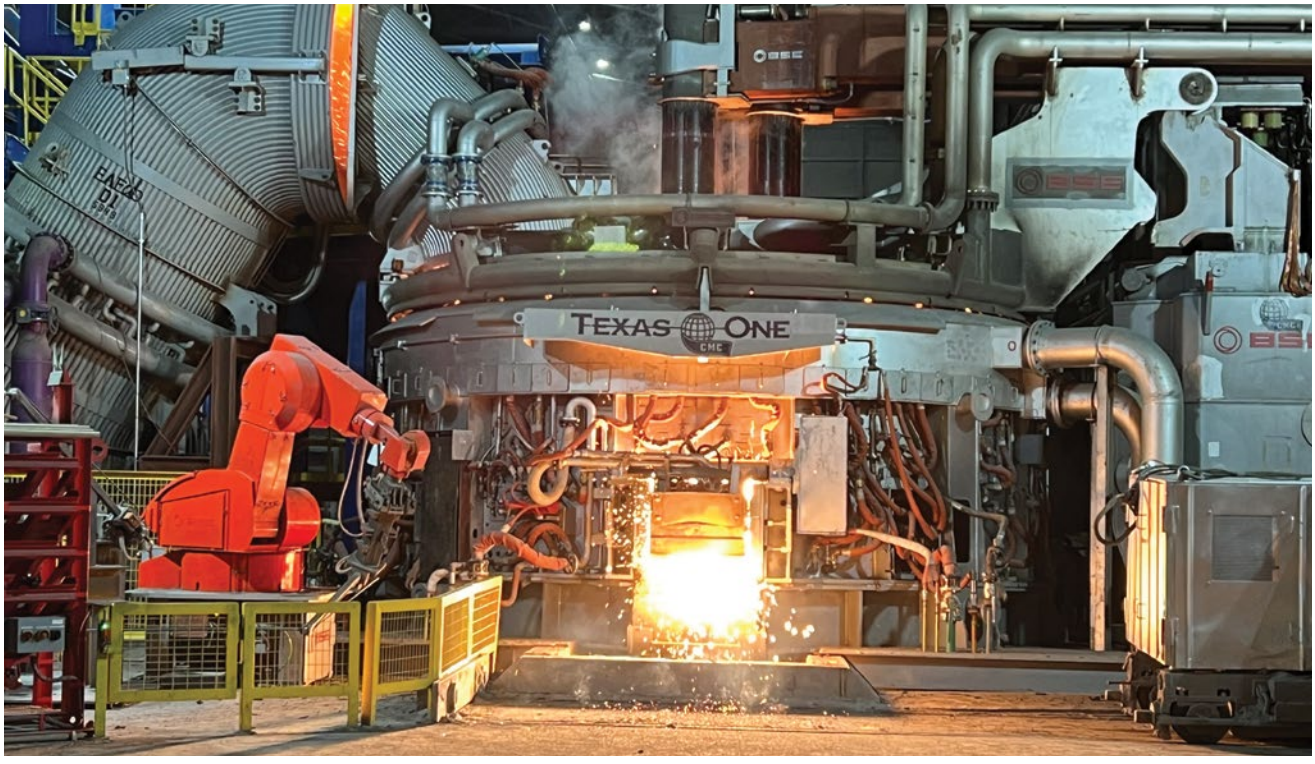
Steel Texas Meltshop Improvements

Key performance indicator or feature	Pre-outage	Post-outage	Δ
Electrical energy/cast ton (KWH/ton)	310	300	10 (3% decrease)
Charge swing cycle: power-off to power-on (second)	70	40	30 (43% decrease)
EAF charge volume (feet^3)	3,990	4,840	850 (21% increase)
Electrode speed (inch/second)	24	34	10 (42% increase)
Fast back (degree/second)	4	6	2 (50% increase)

Other key improvements:
- 25% reduction in scrap-related delays due to increased upper shell volume
- Produced 19 heats in a 12-hour shift the first month of operation

Figure 1

CMC Steel Texas' Texas One electric arc furnace (EAF).



During this period, F furnace produced 127,814 heats, amounting to a total of 15,671,172 tons of steel. Designed as a replace-in-kind EAF for the meltshop, F furnace incorporated some modifications from its predecessor, "E furnace." Notable changes included replacing the single-point lift roof with a two-armed gantry-style roof. However, F furnace largely retained the same design as E furnace, being built on the same foundation and utilizing the same water, alloy and offgas systems.

Issues

Like all equipment over years of operation, F furnace started to show signs of wear. The most critical signs of wear occurred in two portions of the furnace that are not easily replaced — the foundation and the furnace tilt platform.

The foundations of F furnace started to become compromised after years of general wear, loading and the hot environment. The foundations that the F furnace was built upon were the same foundations from furnaces years back. When F furnace was constructed in 2007, new pilasters and a matte were built on the existing piers that were installed in the 1980s. In the winter of 2018, multiple sections of the foundation were excavated to check the integrity of the foundation. The results of this evaluation showed that the compressive strength of the "new" foundation were at best 62% of the original design strength at only 11 years old. With the new EAF is expected to be in service well over 10 years, it was concluded that the foundation, including the piers, were well past their useful life and a completely new foundation would need to be constructed.

Arguably the second most critical item of the furnace is the tilt platform. The existing tilt platform that was built new for F furnace had experienced damage from excess heat and stress. The area with the most issues occurred around the critical point where the furnace gantry attaches to the tail platform, an area of high-level stress. F furnace had tilt cylinders on both sides of the furnace. On further investigation, it is possible this design caused the tilt platform to fatigue over time with tilt cylinders working out of sync, essentially "fighting" each other. The issues in the tilt platform spread to other structures of the EAF. Structural cracking began to occur in the gantry arms, roof structure, and upper and lower shells. This required constant welding on the structures during the meltshop's weekly down days.

There were also issues with the EAF's support equipment. The alloy system was outdated and hindered the ability to add alloys to the ladle at the preferred, steeper tilt angle. The current water system was also unreliable and required a signification amount of maintenance.

These concerns prompted the CMC Steel Texas team to start considering when they would need to commission a new furnace instead of continually fixing issue after issue.

Opportunities

Though there were issues currently with F furnace, they were manageable and not urgent. This gave the CMC team the opportunity to investigate new designs for the new Texas One furnace and make the best possible decisions based on what was available in the market as well as past experience.

CMC Steel Texas also has an on-site oxygen plant and wanted to fully take advantage of the available oxygen. Increased oxygen into the EAF would mean that larger offgas ductwork would be needed to prevent excursions. This in turn creates the need from more cooling water to prevent the ductwork from heat cracking due to the higher temperatures caused by increased oxygen usage.

CMC Steel Texas has always practiced "shell-swapping" where the spare roof, upper shell and lower shell are made ready to change out with the EAF equipment that's currently in use, as opposed to relining the lower shell and taking care of other maintenance on the EAF in place. Due to this practice, changing out the EAF equipment in a timely manner is critical to the shop's operation. This is something the CMC Steel Texas team wanted to improve on.

Project Origination

Internal Discussions

CMC Steel Texas has many employees who have been with the company for decades, witnessing numerous furnace configurations over the years. This extensive experience proved invaluable in designing the new furnace. These seasoned employees could recall which features had worked well for the shop and which had not been as successful in the past. Every aspect, from the roof lifting system to the furnace tilting setup, was thoroughly discussed within the CMC group. Naturally, with a group of people with many years of experience, there were disagreements at times. However, after deliberating the pros and cons, everyone ultimately came together to make a unified decision.

Selecting an EAF Designer

With input and ideas from all CMC Steel Texas employees on how the new meltshop should be constructed, it was crucial to find an EAF designer who could partner with CMC to gather their ideas and implement CMC's designs with their own improvements. Since CMC Steel Texas chose to utilize the brownfield location, there were multiple constraints that required a custom-made furnace and layout. Selecting an OEM with an off-the-shelf EAF option was not feasible.

Over several months in 2019, CMC met with multiple EAF designers and manufacturers to discuss desired furnace features, essentially outlining CMC's "wish list." Naturally, with many CMC employees involved and interviews conducted with multiple furnace OEMs and

manufacturers, there were varying opinions on the best option for the brownfield project. After careful deliberation and multiple site visits to other locations with similar EAFs, CMC Steel Texas decided to move forward with BSE as the furnace OEM.

Design Phase

Project Scope

The project scope for CMC Steel Texas site was far more than just an EAF replacement. For the content of this article, the focus will primarily be on the EAF itself and its immediate supporting equipment. For the project management aspect of the article, the complete project scope is presented in this section.

The following will be discussed in detail:

- New furnace proper, including:
  - Tilt platform.
  - Refractory-lined lower shell.
  - Water-cooled panel upper shell.
  - Water-cooled panel roof.
  - Gantry.
  - Electrode arms.
- High-current system delta with B phase compensation loop.
- MultiROB temperature measurement robot.
- Hydraulic power unit and valve system.

The following was also included in this project but will not be discussed in detail:

- Furnace foundation with drilled piers.
- Alloy system capable of supplying alloys to the ladle at the EAF and ladle metallurgy station (LMS).
- Water-cooled and air-cooled ductwork with drop-out box.
- Meltshop cooling tower and new cooling water system.
- Revamped slag tunnel.

Key Characteristics

The new furnace design features a robust tilt platform and tilting cylinders, along with a space-saving gantry design. It includes precise calculations for the high-current system, encompassing current-conducting analysis (CCA), bus cables and the bus bar system. The main components are rigidly designed, and the hydraulic power unit is optimally sized. These aspects contribute to an increase in charging volume and comparably high furnace motions. Additionally, the modular equipment allows for quick change-outs, enhancing overall efficiency.

Furnace Proper: When designing the tilting platform and gantry, including the electrode and roof lifting system, a certain margin was always considered to avoid exhausting design limits. Consequently, the mechanical components are relatively stiff, and when combined with the powerful hydraulic system, they enable swift EAF movements.

The EAF is designed for quick change-outs of major components, making it modular. The roof lift columns can be changed in just 3 hours, including hooking up the hydraulics. The roof can swing off independently, with hoses being the only manual disconnection required. This full disconnect of the roof greatly helps prevent random arcing in the gantry, as the roof does not physically touch the gantry when the furnace is running.

Robust Tilt Platform and Tilting Cylinders: Originally, CMC Steel Texas had single tilt cylinders on both sides of the furnace. For Texas One, it was decided to use a pair of tilt cylinders on the same side to prevent torquing of the tilt platform. With only one point of force application, engineering a robust tilt platform became much simpler.

Another design change involved relocating the tilt lock. Instead of being positioned on the edge of the tilt platform, the tilt lock was placed directly next to the rocker. This adjustment ensures that if the tilt platform is inadvertently tilted with the lock in place, it won't be damaged by torsion forces. Even if the furnace were to come off the rockers, the tilt lock would still be able to support it without causing damage.

BSE meticulously ran multiple finite element analysis (FEA) loading scenarios on the tilt platform to ensure it was adequately built to withstand not only typical day-to-day operating conditions but also unusual loading situations.

Gantry: The EAF features a space-saving gantry design that combines the benefits of a self-supporting roof (without roof-lifting arms) and slide bearings. By using two sliding bearings, significant loads can be transferred into a smaller installation space compared to conventional designs, resulting in a considerably slimmer gantry. The roof is lifted by two columns located on the sides of the electrode columns, creating a rigid connection between the roof and gantry when the roof is lifted. During operation, the roof is completely disconnected, allowing the gantry to swing independently for maintenance and roof delta changes. This design effectively eliminates arcing between the roof and gantry. Additionally, it allows for the replacement of bearings without removing the gantry.

Design of High-Current System: A significant enhancement is the new design of the high-current system. To ensure electrical symmetry, the old system featured a copper loop attached to electrode arm #2. The arrangement of the high-current cable was unique, and

Figure 2

EAF with roof swung off.

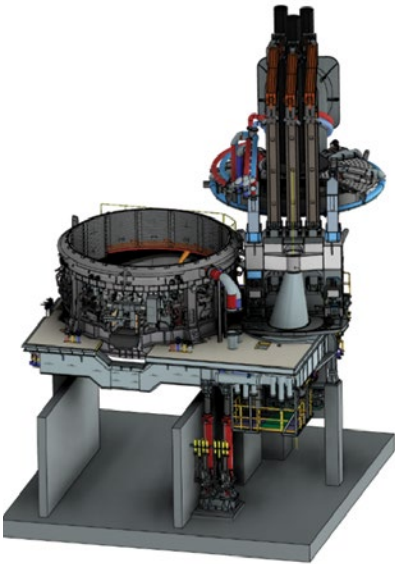
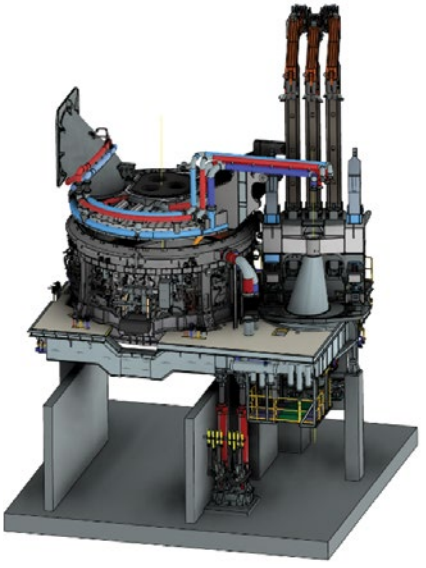


Figure 3

EAF with an independent roof swing.



the shape of the conductive copper-clad electrode arms was relatively complex (see Fig. 4).

The objective of the new design was to simplify the shape of the electrode arms by utilizing BSE's direct water-cooled copper cladding technology. This involved optimizing the arrangement of the high-current cables to extend their lifespan by reducing movements and relocating the loop to the transformer wall (see Fig. 5).

The new loop was integrated with the external delta closure of the new transformer. To achieve the optimal design, BSE utilized its advanced finite network method (FNM) simulation tool, specifically developed for high-current systems. This tool ensures the high accuracy needed to determine the correct loop dimensions, achieving perfect reactance symmetry and resulting in equal properties of the arcs (length, radiation, power) on average. Symmetrical operation is always beneficial for power input and helps avoid refractory wear related to hot spots.

Hydraulic Power Pack: In general, the equipment sizing strategy always included a certain margin to accommodate future optimizations. As a result, the hydraulic power pack and valve rack are designed to ensure they will not become limiting factors.

The hydraulic system was specifically designed to enable the high speeds and time savings achieved with Texas One. This was due to not only its generous sizing, but also the implementation of modern control

Figure 4

Old bus bar arrangement (colors: current density).

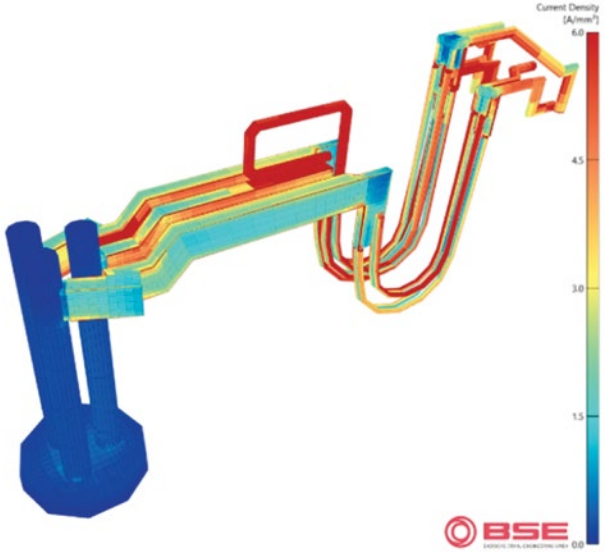


Figure 5

New bus bar design (colors: current density).

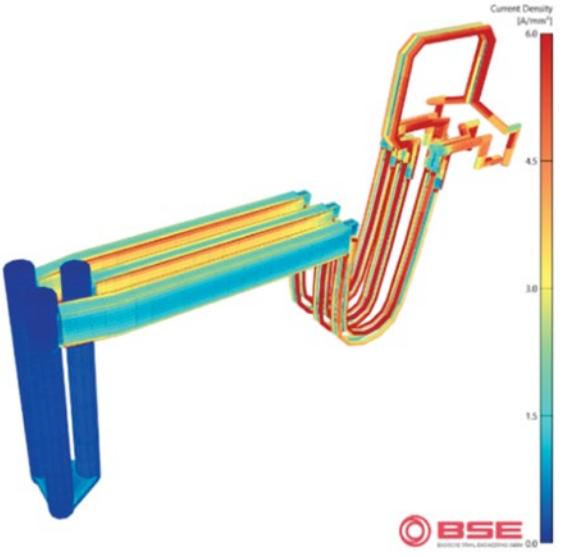
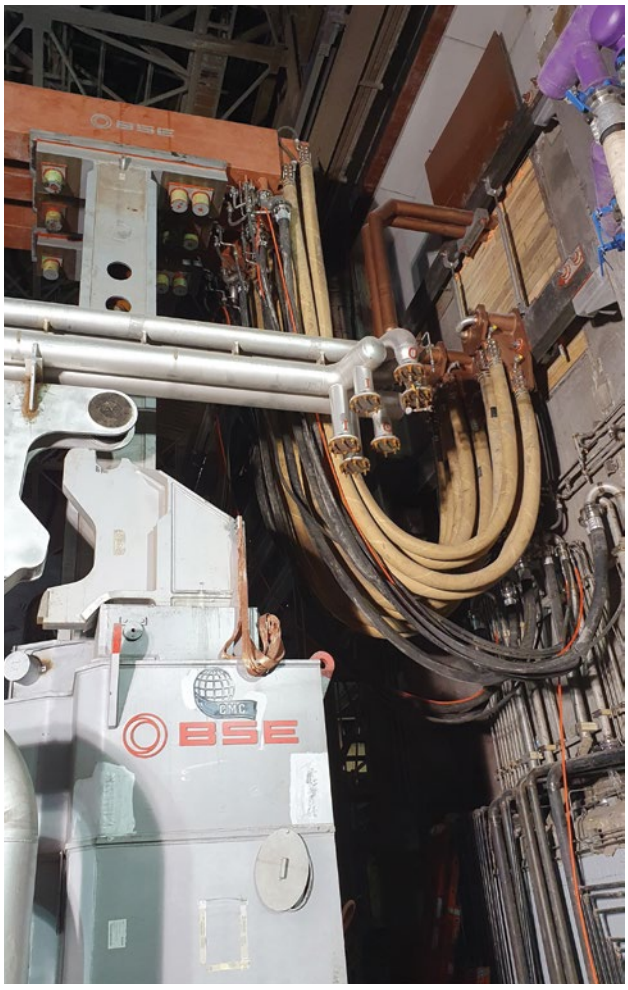


Figure 6

New high-current system after installation.



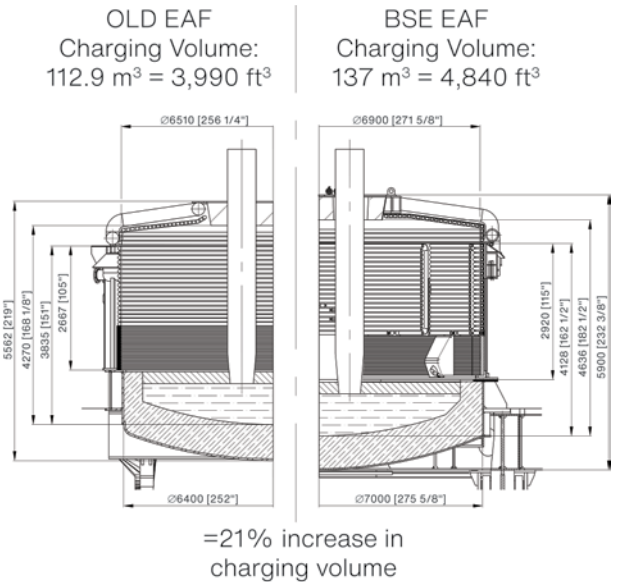
technology, ensuring that these rapid movements remain fully controlled at all times.

Additionally, the system was designed to maintain stable performance despite significant temperature fluctuations throughout the day, which are common in Texas. While piston accumulators with nitrogen cushions are a standard solution for EAFs, their sizing and configuration were carefully tailored to compensate for these extreme variations. This ensures consistent pressure levels and optimal system response under all operating conditions.

Shell Volume Expansion: The gantry design, combined with the precise calculation of the high-current system, allowed the electrode lifting columns to be positioned closer to the transformer wall. This adjustment enabled an increase in the shell diameter, resulting in a 21% increase in charging volume. This significant increase in charging volume was a key factor in selecting the furnace design. Fig. 7 illustrates the shell volume comparison between the old EAF (F furnace) and the new BSE EAF (Texas One).

Figure 7

Comparison of old shell vs. new shell.



Additional Furnace Features

RTD Cable Channel: A cable conduit was installed directly below the upper shell cooling water distributor, providing a protected space for the resistance temperature detector (RTD) sensors and their cabling. This setup significantly reduced constant problems and downtime caused by burnt RTD cables.

Figure 8

Cable duct protecting resistance temperature detector (RTD) installation.

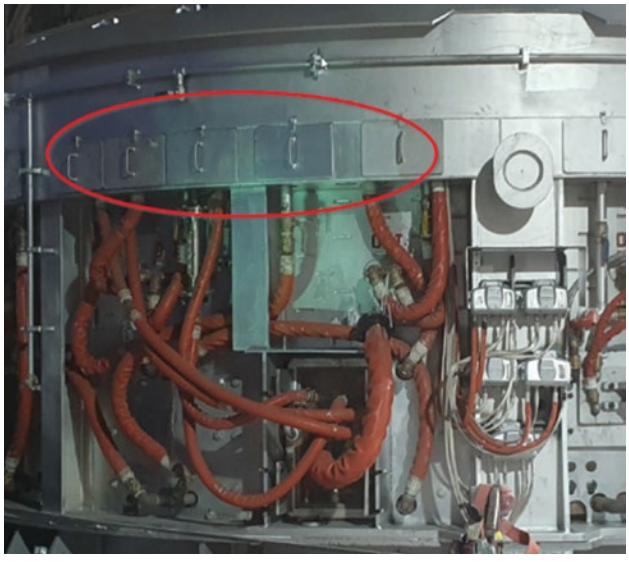
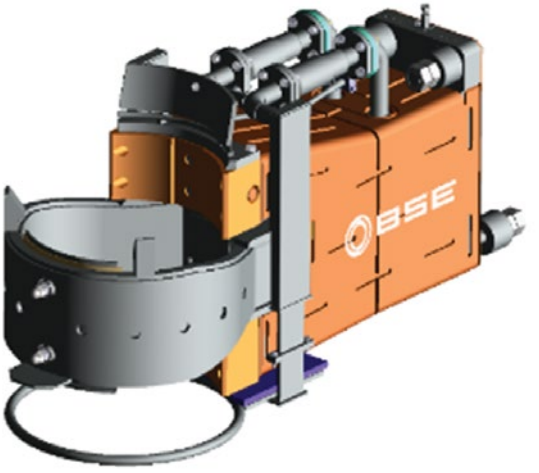


Figure 9

RTDs and shutoff valves inside protected duct.

Figure 10

Detachable holder (direct-cooled copper arm design).



Detachable Electrode Clamps: The three electrode arms feature detachable electrode clamps or holders, allowing the front part of the electrode arm to be easily exchanged and replaced with a spare in case of any issues. Since these three clamps are identical, the number of spare parts required is significantly reduced.

MultiROB

The scope of the EAF project was expanded to include the BSE MultiROB temperature robot. The MultiROB is an automated system featuring an industrial 6-axis robot enhanced with customized heat shields to withstand the harsh conditions of a meltshop. It can automatically change tool heads and reload temperature/sampling cartridges using an automated cartridge rack.

The mechanical design of the tool change ensures that the lances remain in position even in the worst-case scenario of a system failure, such as a collision, preventing the lance from falling and avoiding further risk. This design prioritizes safety.

The cartridge rack has a very compact and practical design. It has different cartridge layers for temperature measurement or sample-taking depending on the needs, and it's equipped with a light barrier system that determines the tool data for the robot, increasing the system's reliability to ~90%. The system has had some challenges, and it's been improving since the first iteration of the MultiROB system, constantly pushing for a 99% reliability.

Final Layout

To improve project layout management, a comprehensive 3D scan of both the interior and exterior of the meltshop was conducted. These scans were combined to create an interactive 3D model, significantly enhancing project management by clearly identifying any existing equipment and structures that might interfere with new

Figure 11

MultiROB during cold commissioning.

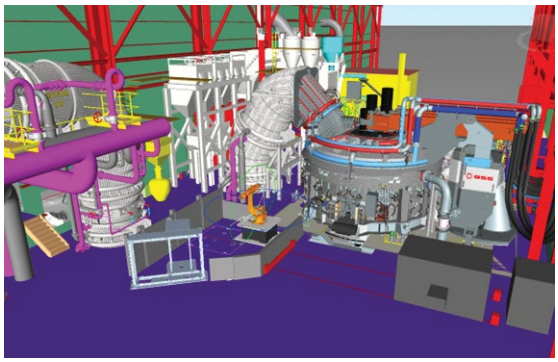
proposed installations. All critical dimensions were field-checked and measured.

Fig. 12 illustrates the final layout of the meltshop's mezzanine level, detailing the arrangement of the EAF, the positioning of the MultiROB, the connection of the fourth-hole elbow and offgas ductwork, the new alloy system in the background, and some of the new cooling water piping.

Utilizing this technology enabled the project team to optimize the spatial configuration of the meltshop, thereby ensuring the installation of the largest feasible EAF without compromising the operational efficiency of the shop.

Figure 12

Final layout of meltshop.



Construction Phase

Planning and Preparation

As with all modernization projects, the time allocated for an outage is very limited, resulting in a highly compressed schedule. To manage the various jobs, contractors and equipment, the CMC team began scheduling meetings months in advance of the planned outage. The outage was scheduled to start on 10 January 2023, and was expected to last 51 days, with over 100 employees and contractors working around the clock. To minimize downtime, the project team made every effort to preassemble equipment as much as possible before the start of the outage. The planning team developed a Microsoft Project Gantt chart with well over 1,000 tasks.

In addition to planning and scheduling tasks, working in a confined area required close monitoring of contractor locations. Contractors were working on all three levels of the meltshop, from the ground level to the mezzanine and up to the roof. With safety being of the utmost importance, it was critical to ensure that any lifts did not pass over contractors working below.

Preassembly and Early Nonoutage Construction

To compress the outage schedule, as much preassembly work was done outside of the meltshop as possible. The tilting platform was equipped with part of the gantry support off-line. A dedicated lifting cradle was manufactured to handle the equipment in this configuration. The gantry itself had already been equipped with all cylinders and lifting columns off-line and assembled as a complete unit.

To take full advantage of the limited outage period, any equipment or buildings that could be constructed early were prioritized. The new hydraulic power unit (HPU) building was constructed outside the meltshop, allowing the existing hydraulic system to operate while the new unit was assembled, tested and the new piping prepared as much as possible. On the mezzanine floor of the meltshop, a building was erected to house the hydraulic valve room prior to the outage. Although the hydraulic piping was only partially routed before the outage, a significant portion was completed in advance.

The same approach was applied to the cooling water system. The new cooling tower, pumps, strainers and piping, as well as the electrical control building, were constructed almost a year before the furnace outage. This allowed the cooling water system to be tied into F furnace, enabling full commissioning before the new furnace equipment was installed. The new cooling water system operated with the old furnace for approximately 9 months before the outage.

During the Outage

The outage began as scheduled on 10 January 2023, with the demolition of the existing furnace equipment proceeding swiftly, thanks to CMC Steel Texas' experienced crew, who regularly performed shell swaps every 3–4 months. Other contractors started dismantling the alloy system, ductwork, dropout box and piping. The final element to be demolished was the foundation. Each

Figure 13

Tilt platform fully preassembled.

Figure 14

Gantry fully preassembled.

contractor crew had a CMC supervisor as their primary point of contact to ensure clear communication between contractors and CMC employees. Hand-off meetings occurred at every shift change, and planning update meetings were held every afternoon to monitor project progress and allocate resources as needed.

Within a few days, the old equipment and foundations were cleared from the meltshop. Construction of the new drilled piers and foundations began, followed by the installation and stacking of the new furnace. Thanks to extensive preassembly efforts, the mechanical assembly of the new equipment proceeded quickly. The final runs, hookups, and checkouts of the electrical, hydraulic and water systems took some time, as personnel needed to clear the area for safety during testing and adjustments.

Despite the long hours, the outage was completed safely with no lost-time incidents, thanks to excellent communication and planning. The additional planning efforts shortened the outage by 3 days, resulting in nearly a 6% reduction in downtime. This allowed the meltshop operators to begin ramping up operations 3 days earlier than expected.

Ramping Up and Continuing Operation With Texas One

Ramping Up and Immediate Benefits

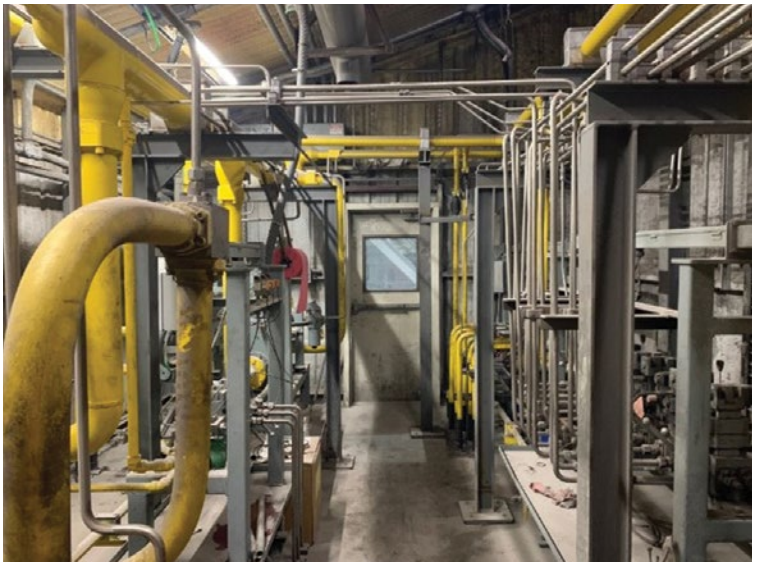
With the new furnace now operational, several immediate benefits were realized. The increased shell volume

Figure 15

Hydraulic power unit building.

Figure 16

Hydraulic valve room on mezzanine floor.



ensured that more scrap remained inside the furnace, preventing it from falling out and damaging equipment or piling up around the furnace, which previously restricted access. The hydraulic motions of Texas One were smoother and faster than previous models, significantly reducing the time needed to charge the furnace. This increase in speed enabled the meltshop operators to produce 19 heats in a 12-hour shift during the first month of operation, far exceeding the team's original expectations.

Continuing Operations and Future Improvements

The CMC Steel Texas team has been very satisfied with the improvements and efficiencies that Texas One has brought to the meltshop, but they are always looking toward the future. CMC Steel Texas is continually seeking ways to operate more efficiently and safely. Two EAF-enhancing features that CMC Steel Texas is moving forward with are BSE's Tap Hole Manipulator (THM) and Smart Leak Detection (SLD) program. The THM will be installed on Texas One's tilt platform and will be capable of cleaning the taphole between heats without human interaction. The SLD program uses flowmeters that constantly monitor the water flow around the EAF, alerting operators to any detected water leaks and automatically shutting down water flow to the leaking circuit.

Project Challenges

Overcoming Multiple Global Catastrophes

When the initial discussions of a new furnace began in 2018, no one could have foreseen the unfortunate timing of this project. In April 2020, the ink was still wet on the CMC/BSE contract when all international travel was suspended due to the COVID-19 pandemic. All basic and design engineering between CMC and BSE had to be handled virtually. Though the team adapted quickly to this new remote setting, BSE was not able to be on-site throughout the duration of the design phase and had to rely solely on 3D models, pictures and CMC's field support.

As soon as the COVID-19 restrictions were beginning to subside, the war in Ukraine started hindering the production capabilities in Europe where the gantry, electrode arms and other major components were built. Fortunately, most of the equipment was already in fabrication so the effect was not quite as significant as it could have been. However, this still added a level of uncertainty to shipping timelines from Europe to the United States.

Managing Costs With Creative Engineering

Both global catastrophes caused a steep increase in material and labor costs, leading some portions of the project to go over budget. The project team had to be creative in making the equipment work during the engineering phase without incurring additional costs. One example of the team's innovation was in designing the tilt platform, ladle fork and alloy system chute interconnection. The more robust platform created an interference with the position of the ladle on CMC's existing ladle fork. Initially, the plan was to lower CMC's ladle fork to tilt the furnace at a steeper angle and prevent slag carryover into the ladle. However, lowering the ladle fork would have cost over US$1 million and added multiple days to the outage due to its critical path.

The teams worked through multiple iterations of the alloy chute and tilt platform design to ensure that CMC Steel Texas could deliver alloys to the ladle while the furnace was in its fully tapped position, without the costly venture of lowering the fork. Although this took several weeks of engineering, the system ultimately worked without the need for additional construction to lower the fork.

Custom-Designed Equipment Challenges

One of the biggest reasons that CMC decided to move forward with the BSE team was its specialty in providing custom-built equipment for brownfield shops. The BSE team was open to the CMC team's ideas and actively worked them into their designs. The end product of the furnace turned out to be exactly what CMC asked for, but there were some challenges along the way that might not have been the case with an off-the-shelf furnace. The engineering of a furnace tailored exactly to the clients' needs does take significantly longer time — especially when every piece of the furnace is scrutinized to the finest detail to make sure it fits exactly what the CMC operators and maintenance team wish to have. In doing this stringent engineering process, and being held to a tight schedule, not all of these new designs were fully checked to the *n*th degree.

An example of this was when designing the two roof lifting columns/arms and three electrode-lifting columns. CMC wanted to ensure that the roof and the electrodes could be swung off independently from one another.

As the EAF shell was significantly increased, the roof diameter also had to grow. With BSE's standard design, the roof would have hit a building column when completely off the furnace. Since the centerline of the EAF had to remain the same, the only way to avoid this interference was to shift the pivot point of the gantry by approximately 20 inches. Texas One now has a pivot point directly on the centerline of the shell, while BSE's standard design (like most other designs) has the gantry pivot point located more toward the slag door side of the EAF.

Due to this shift in the pivot point, the roof-lifting columns had to be rearranged, and their claws had to be lengthened. With these design changes, the roof now fits exactly between two building columns when fully open, allowing for easy shell swaps. However, after the furnace was commissioned, it was discovered that the roof and the electrode arms could not swing independently without contacting each other in the early stages of swinging the roof.

Figure 17

The CMC and BSE team in front of the Texas One EAF after striking the first arc.

The reason for this missed interference was the new kinematics of the gantry swing combined with the wider roof-lifting columns. During the design phase, the positions of the swing were only shown with the furnace roof and electrodes fully on the furnace and fully swung off. The intermediate swing positions were not checked carefully enough. As the gantry started to swing off the furnace with the roof still on the shell, the electrode column contacted the roof. This interference might have been caught if the positions were shown at every degree, and it would not have been an issue if BSE's original design had not been altered.

Figure 18

The CMC team in front of the Texas One EAF after hot commissioning.

After commissioning the furnace, CMC was able to use it without needing to swing the roof and electrode arms independently while BSE worked on a solution. Seven months later, in September 2023, modification pieces for the roof and roof arms were delivered and commissioned at CMC Steel Texas to resolve this issue. Although BSE worked quickly to address the problem, this situation highlights the importance of thoroughly checking custom-designed equipment for any unforeseen issues.

Conclusion

The extensive upgrade of CMC Steel Texas' meltshop with the Texas One electric arc furnace, in collaboration with BSE, has been a remarkable achievement. Despite facing significant challenges, including global disruptions and the need for innovative engineering solutions, the project team successfully enhanced the reliability and productivity of the meltshop. The new furnace, with its advanced design features and increased shell volume, has already demonstrated substantial improvements in operational efficiency and safety.

The proactive measures taken during the project, such as extensive preassembly work and the implementation of cutting-edge technologies, have set a new benchmark for modernization projects in the steel industry. The dedication and collaboration of all involved, from CMC employees to BSE and various contractors, have been instrumental in the project's success. As CMC Steel Texas continues to explore advanced technologies and innovative solutions, they remain committed to maintaining their world-class status as a leader in the industry.

The successful implementation of Texas One is a testament to the team's hard work and ingenuity, paving the way for continued success and growth for future generations at CMC Steel Texas.

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